

TOTAL IONIZING DOSE TEST REPORT

Part Type: AD8021ARZ

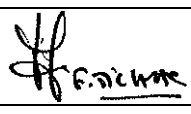
Package: SOIC-08

Description: Low Noise, High Speed Amplifier for 16-Bit Systems

Manufacturer: Analog Devices

Date Code: 1640

Esa Estec Purchase Order N° 22327/09/NL/SFe / Call-off Order 6 dated July 13, 2017

Hirex reference:	HRX/TID/01555	Issue:01	Date:	December 4, 2017
Written by:	O. PERROTIN	Test Lab Engineering Manager		
Approved by:	F. TILHAC	Test Lab Manager		

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

TOTAL IONIZING DOSE TEST REPORT **on Analog Devices** **AD8021ARZ** **Low Noise, High Speed Amplifier for 16-Bit Systems**

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1 Introduction

A total ionizing dose verification test of the Analog Devices AD8021ARZ, Low Noise, High Speed Amplifier for 16-Bit Systems has been performed with an accumulated dose of about 49 krad(Si) at a dose rate of 210 rad(Si)/hour, in response to Esa Estec purchase order reference 22327/09/NL/SFe / Call-off Order 6.

The purpose of this test was to evaluate total dose tolerance of this component, to investigate its suitability for being used in space applications. This test was conducted on samples provided by Esa Estec. Test has been performed in accordance with Hirex Engineering proposal reference HRX/EMP/07041 dated 20/06/2017.

A complete set of electrical measurements together with their graphical representation of measured parameters with respect to total dose received, are provided for all samples.

2 Applicable and Reference Documents

2.1 Applicable Documents

- Hirex Engineering proposal: HRX/EMP/07041 dated 20/06/2017
- Hirex engineering Test plan reference: HRX/TDP/00106 issue 01.
- Hirex Engineering Detail Design Document: HRX/DDD/02500 Issue 01
- Hirex Engineering Test Conditions: HRX/TC/01833 Issue 01
- ESCC Basic Specification No. 22900 issue 05.

2.2 Reference Documents

- Analog Devices Datasheet Rev. F

3 Test Samples

11 samples of the AD8021ARZ device have been tested (5 ON + 5 OFF + 1 control sample).

Samples were allocated into the bias conditions during exposures and annealing as provided in the following table.

Serial Numbers	Allocation
1	Control
2	Biased ON
3	Biased ON
4	Biased ON
5	Biased ON
6	Biased ON
7	Biased OFF
8	Biased OFF
9	Biased OFF
10	Biased OFF
11	Biased OFF

Identification of the AD8021ARZ is provided below:

Part Number:	AD8021ARZ	Trace Number:	-
Top Marking:	8021A logo #1640 . 2877	Bottom Marking	-
Diffusion Lot:	-	Manuf Lot Number:	AN66418.7
Date Code:	1640		

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Identification of the component including external marking and any die identification is provided on the following photos.

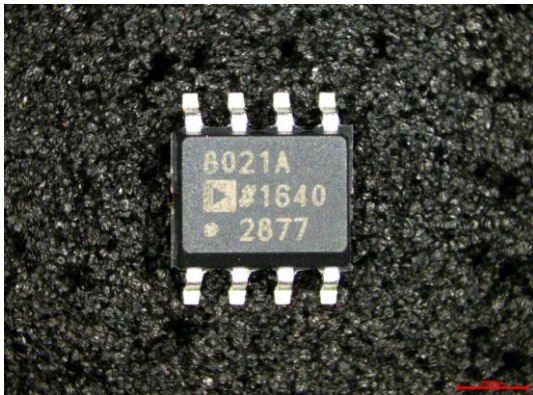


Photo 1 – Device Top Marking

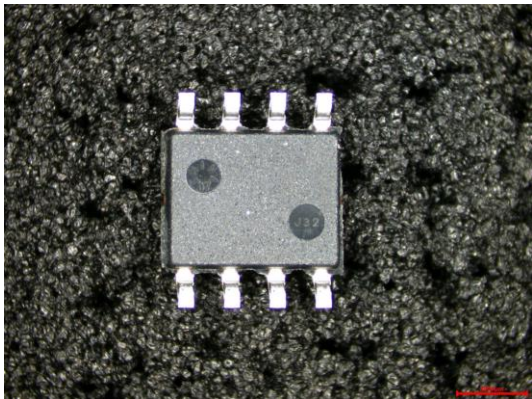


Photo 2 – Device Bottom Marking

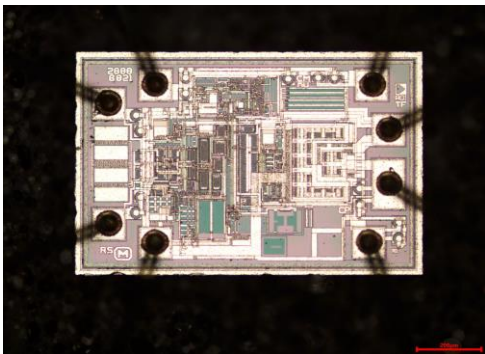


Photo 3 – Die, View

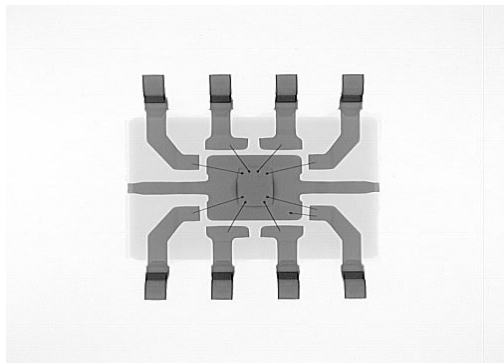


Photo 4 – Rx Top View

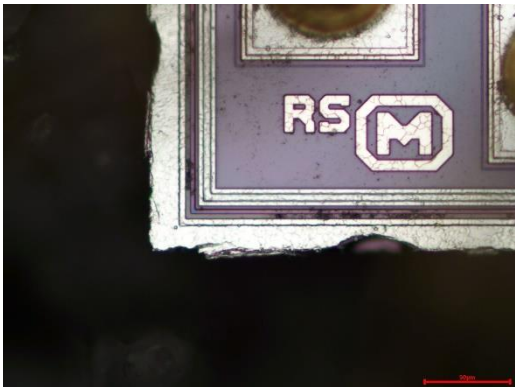


Photo 5 – Die, Marking

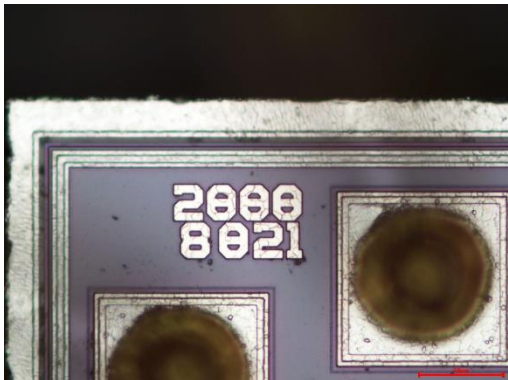


Photo 6 – Die, Marking

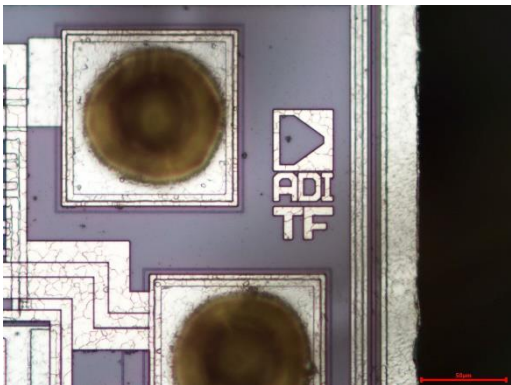


Photo 7 – Die, Marking

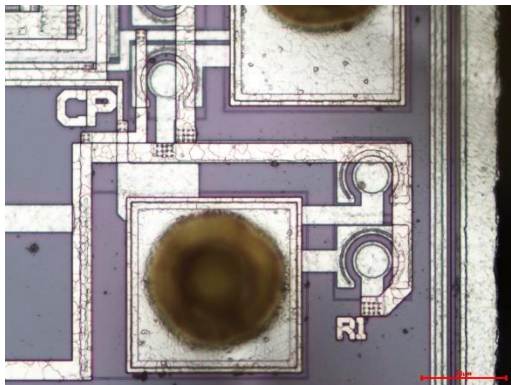


Photo 8 – Die, Marking

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4 Experimental Conditions

4.1 Radiation Source Dose Rate and Annealing

The dose exposures were performed at GAMRAY facility in Toulouse (France). In this irradiation facility, a Cobalt 60 source is used with the possibility to vary the dose rate by simply adjusting the distance to the source.

During the dose exposures, devices under test have been irradiated in an ambient temperature of $24^{\circ}\text{C} \pm 6^{\circ}\text{C}$.

Before exposure, dose rate calibration, using an active dosimeter SAPHYMO gamma probe, was performed at each board location.

Resulting test conditions are provided below.

CO⁶⁰ irradiation certificate is provided in appendix 1.

Total Irradiation Dose	Average Pellet Dosimetry data	Dose rate	Annealing steps	Temp.	Irradiation Date Out	Start Meas Time	End Meas Time	Irradiation Date In
krad (Si)	krad(Si)	rad(Si)/h	Hours	°C				
0	0	-	-	Room	-	-	-	11/13/17 10:26
5	4.9	210	-	Room	11/14/17 9:36	11/14/17 9:52	11/14/17 10:26	11/14/17 11:32
10	9.4	210	-	Room	11/15/17 9:33	11/15/17 9:48	11/15/17 10:05	11/15/17 11:32
20	19.8	210	-	Room	11/17/17 14:02	11/17/17 14:28	11/17/17 14:44	11/17/17 16:01
35	34	210	-	Room	11/20/17 9:33	11/20/17 9:51	11/20/17 10:10	11/20/17 11:31
50	49.3	210	-	Room	11/23/17 14:01	11/23/17 14:20	11/23/17 14:41	11/23/17 16:00
-	-	-	24	Room	11/24/17 14:30	11/24/17 14:43	11/24/17 14:59	11/24/17 15:30
-	-	-	168	100	12/01/17 15:30	12/01/17 15:43	12/01/17 16:38	-

4.2 Bias during Dose Exposures and Measurements conditions

4.2.1 Bias conditions

During exposures bias board provided by HIREX (reference: PL317A) allowed to bias 5 samples in accordance with the electrical circuit provided in Figure 1.

5 other samples were biased OFF with all pins connected to ground.

During annealing steps the same stress conditions have been applied at room and 100°C temperatures.

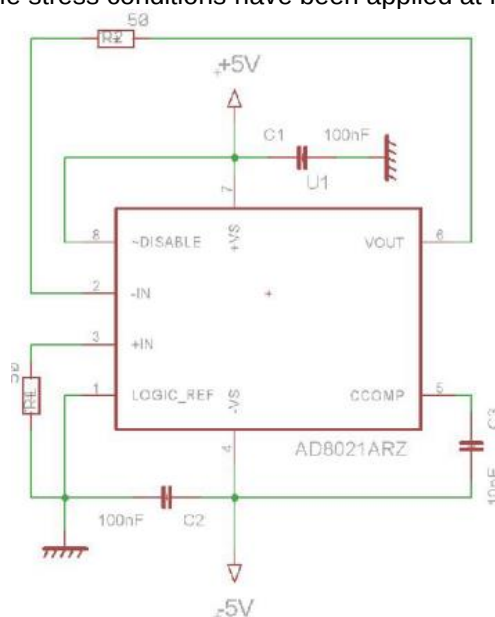


Figure 1 : Bias Conditions during Irradiation Exposures and Annealing

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
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4.2.2 Electrical Measurements

Electrical parameters test setup synoptic for AD8021ARZ is provided in Figure 2.

One HP4142 DC tester was used to perform required measurements.

Dedicated test fixture boards (Hirex references: CM539B + CS087A) were designed to ensure proper measurement conditions.

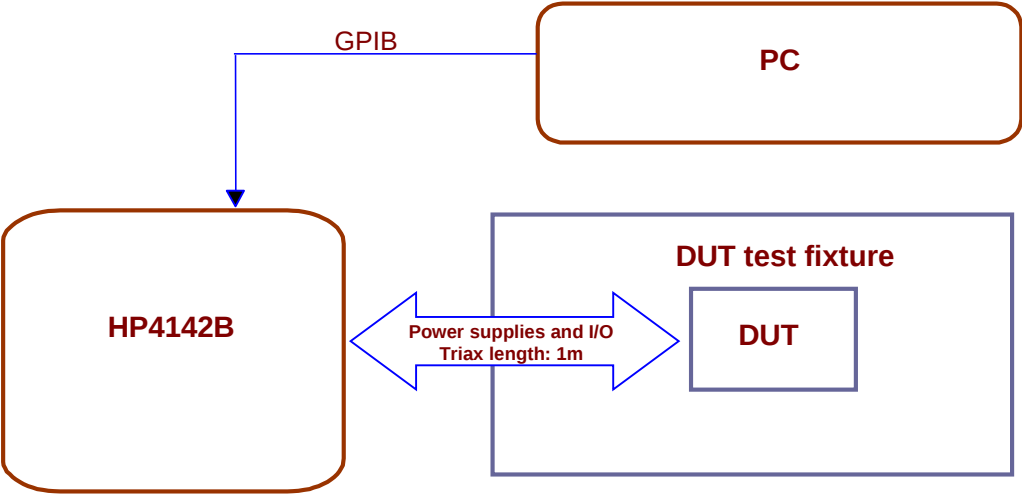


Figure 2: AD8021ARZ test setup synoptic

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
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Electrical parameters test conditions and limits used for performing this test are given in the following table.

PARAMETERS	SYMBOLS	TEST CONDITIONS	MIN	MAX	UNITS
Vs = ±5V, RL = 1KΩ, unless otherwise specified					
Input Offset Voltage	Vos ±5V		-1	1	mV
Input Offset Current	Ios ±5V		-500	500	nA
Input Bias Current (plus)	Iib+ ±5V			10.5	μA
Input Bias Current (minus)	Iib- ±5V			10.5	μA
Open Loop Voltage Gain	Av ±5V		82		dB
Common Mode Rejection Ratio	CMRR ±5V	Vcm = ±4V	86		dB
Output Voltage Swing (plus)	Vout+ ±5V		3.2		V
Output Voltage Swing (minus)	Vout- ±5V			-3.5	V
Positive Supply Current	Is+EN ±5V	Output Enabled		7.7	mA
Negative Supply Current	Is-EN ±5V	Output Enabled	-7.7		mA
Positive Supply Current	Is+DIS ±5V	Output Disabled		1.6	mA
Negative Supply Current	Is-DIS ±5V	Output Disabled	-1.6		mA
Power Supply Rejection Ratio (plus)	PSRR+ ±5V	Vcc = +4V to +6V. Vee = -5V	86		dB
Power Supply Rejection Ratio (minus)	PSRR- ±5V	Vcc = 5V. Vee = -6V to -4V	86		dB
Vs = ±12V, RL = 1KΩ, unless otherwise specified					
Input Offset Voltage	Vos ±12V		-1	1	mV
Input Offset Current	Ios ±12V		-500	500	nA
Input Bias Current (plus)	Iib+ ±12V			11.3	μA
Input Bias Current (minus)	Iib- ±12V			11.3	μA
Open Loop Voltage Gain	Av ±12V		84		dB
Common Mode Rejection Ratio	CMRR ±12V	Vcm = ±10V	86		dB
Output Voltage Swing (plus)	Vout+ ±12V		9.8		V
Output Voltage Swing (minus)	Vout- ±12V			-10.2	V
Positive Supply Current	Is+EN ±12V	Output Enabled		8.6	mA
Positive Supply Current	Is-EN ±12V	Output Enabled	-8.6		mA
Positive Supply Current	Is+DIS ±12V	Output Disabled		2	mA
Negative Supply Current	Is-DIS ±12V	Output Disabled	-2		mA
Power Supply Rejection Ratio (plus)	PSRR+ ±12V	Vcc = +11V to +13V. Vee = -12V	86		dB
Power Supply Rejection Ratio (minus)	PSRR- ±12V	Vcc = 12V. Vee = -11V to -13V	86		dB
Vs = +5V, RL = 1KΩ, unless otherwise specified					
Input Offset Voltage	<u>Vos 5V</u>		-1	1	mV
Input Offset Voltage	<u>Ios 5V</u>		-500	500	nA
Input Bias Current (plus)	<u>Iib+ 5V</u>			10.3	μA
Input Bias Current (minus)	<u>Iib- 5V</u>			10.3	μA
Open Loop Voltage Gain	<u>Av 5V</u>		72		dB
Common Mode Rejection Ratio	<u>CMRR 5V</u>	Vcm = +1.5V to +3.5V	84		dB
Output Voltage Swing (plus)	<u>Vout+ 5V</u>		3.38		V
Output Voltage Swing (minus)	<u>Vout- 5V</u>			1.25	V
Positive Supply Current	<u>IsEN 5V</u>	Output Enabled		7.5	mA
Positive Supply Current	<u>IsDIS 5V</u>	Output Disabled		1.5	mA
Power Supply Rejection Ratio (plus)	<u>PSRR+ 5V</u>	Vcc = +4.5V to +5.5V. Vee = 0V	74		dB
Power Supply Rejection Ratio (minus)	<u>PSRR- 5V</u>	Vcc = 5V. Vee = -0.5V to +0.5V	76		dB

Table 1 : Measured electrical parameters

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5 Conclusion

A Total Ionizing Dose verification test was carried out by Hirex Engineering under Esa Estec contract on the Analog Devices AD8021ARZ Low Noise, High Speed Amplifier for 16-Bit Systems in SOIC-08 package.

10 samples plus one control sample were used during testing. They were exposed to radiation using a dose rate of 210 rad(Si)/hour at room temperature.

All parameters remained within specification limits all along testing.

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6 Test Results

Test results including tables and graphics are provided in this section for each measured parameter.

Statistics are provided for biased ON and biased OFF samples.

Control sample have been measured before and after each electrical measurement step. Corresponding control sample data (identified respectively "IN" and "OUT") are provided here after.

Failed values (if any) with respect to specified limits are highlighted in bold red font in the tables.

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

Parameter : Input Offset Voltage : Vos_±5V

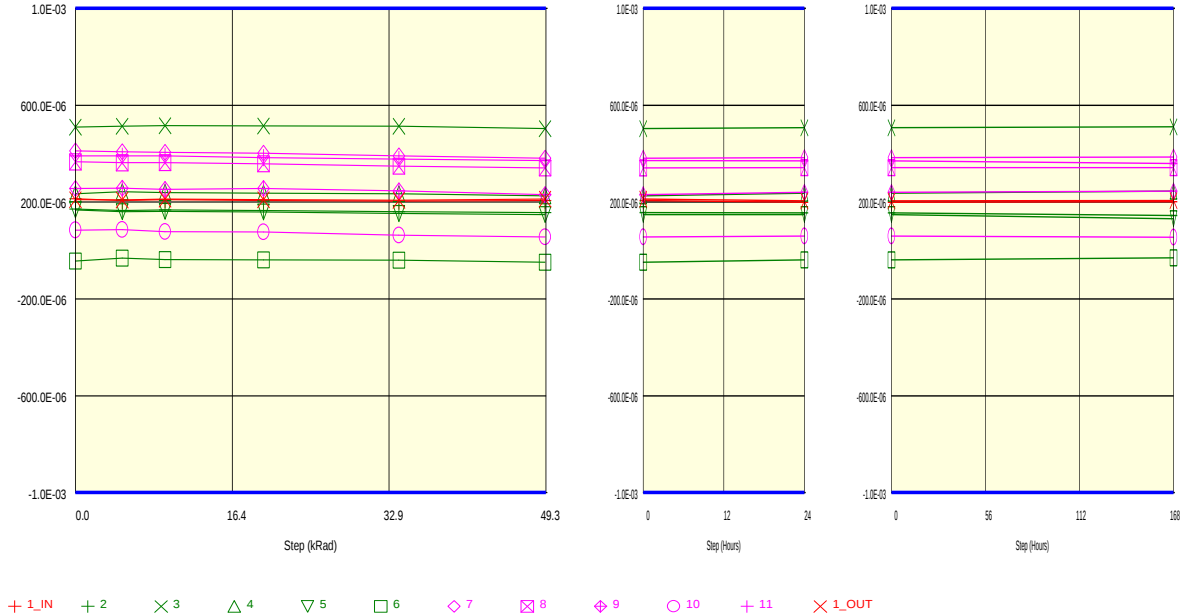
Test conditions :

Unit : V

Spec Limit Min : -1.0E-03

Spec Limit Max : 1.0E-03

Spec limits are represented in bold lines on the graphic.



Measurements

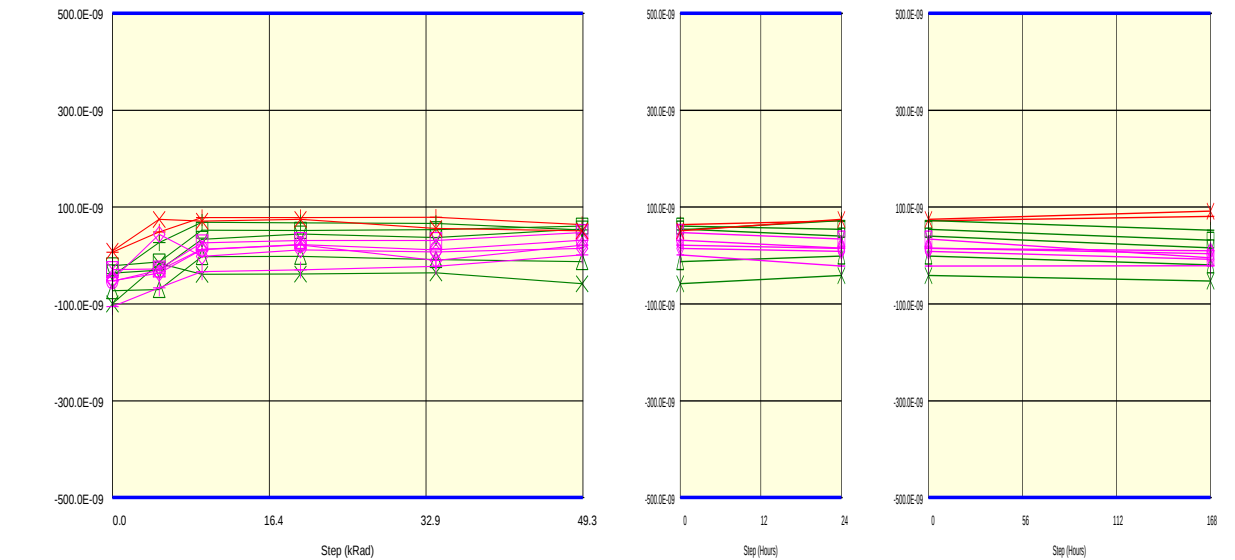
Vos_±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1 IN_REF	213.7E-06	206.5E-06	209.8E-06	206.5E-06	204.7E-06	206.6E-06	199.9E-06	202.1E-06
1 OUT_REF	209.9E-06	208.9E-06	212.7E-06	209.8E-06	207.8E-06	212.7E-06	205.4E-06	207.0E-06
ON samples								
2	170.8E-06	165.9E-06	167.2E-06	165.8E-06	160.6E-06	156.8E-06	155.2E-06	145.2E-06
3	509.8E-06	513.5E-06	515.6E-06	515.3E-06	513.9E-06	504.1E-06	507.3E-06	510.7E-06
4	234.9E-06	243.0E-06	240.0E-06	237.4E-06	234.7E-06	225.6E-06	237.4E-06	246.0E-06
5	168.1E-06	160.9E-06	161.7E-06	158.7E-06	152.6E-06	148.9E-06	147.9E-06	130.9E-06
6	-43.3E-06	-30.8E-06	-37.2E-06	-39.1E-06	-39.7E-06	-48.0E-06	-38.7E-06	-30.0E-06
Statistics								
Min	-43.3E-06	-30.8E-06	-37.2E-06	-39.1E-06	-39.7E-06	-48.0E-06	-38.7E-06	-30.0E-06
Max	509.8E-06	513.5E-06	515.6E-06	515.3E-06	513.9E-06	504.1E-06	507.3E-06	510.7E-06
Average	208.1E-06	210.5E-06	209.4E-06	207.6E-06	204.4E-06	197.5E-06	201.8E-06	200.5E-06
Std Deviation	177.7E-06	176.4E-06	178.6E-06	179.2E-06	179.4E-06	178.4E-06	177.5E-06	178.5E-06

Measurements

Vos_±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1 IN_REF	213.7E-06	206.5E-06	209.8E-06	206.5E-06	204.7E-06	206.6E-06	199.9E-06	202.1E-06
1 OUT_REF	209.9E-06	208.9E-06	212.7E-06	209.8E-06	207.8E-06	212.7E-06	205.4E-06	207.0E-06
OFF samples								
7	411.5E-06	407.9E-06	406.1E-06	402.0E-06	391.0E-06	380.9E-06	383.9E-06	386.0E-06
8	366.2E-06	362.6E-06	363.6E-06	358.5E-06	348.7E-06	340.8E-06	342.6E-06	342.7E-06
9	256.6E-06	257.4E-06	253.0E-06	255.8E-06	246.7E-06	230.9E-06	240.7E-06	245.1E-06
10	84.6E-06	86.1E-06	77.6E-06	76.6E-06	63.2E-06	56.0E-06	59.8E-06	55.4E-06
11	391.3E-06	391.4E-06	391.0E-06	384.4E-06	377.6E-06	371.4E-06	370.4E-06	359.0E-06
Statistics								
Min	84.6E-06	86.1E-06	77.6E-06	76.6E-06	63.2E-06	56.0E-06	59.8E-06	55.4E-06
Max	411.5E-06	407.9E-06	406.1E-06	402.0E-06	391.0E-06	380.9E-06	383.9E-06	386.0E-06
Average	302.1E-06	301.1E-06	298.3E-06	295.5E-06	285.5E-06	276.0E-06	279.5E-06	277.6E-06
Std Deviation	121.2E-06	119.6E-06	122.7E-06	120.6E-06	122.1E-06	122.3E-06	120.7E-06	120.9E-06

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Parameter : Input Offset Current : **los_±5V**
Test conditions :
Unit : A
Spec Limit Min : -500.0E-09
Spec Limit Max : 500.0E-09
Spec limits are represented in bold lines on the graphic.

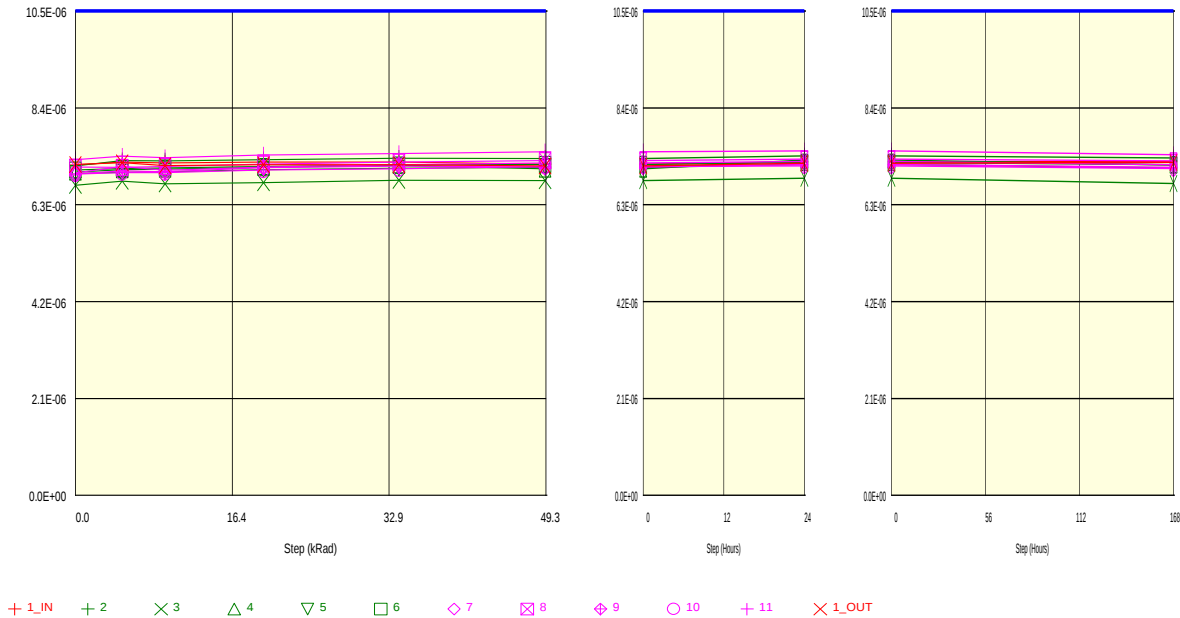


+ 1_IN + 2 × 3 △ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 × 1_OUT

Measurements								
los_±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	7.0E-09	48.9E-09	78.5E-09	78.5E-09	78.8E-09	63.6E-09	72.0E-09	80.9E-09
1_OUT_REF	9.0E-09	75.0E-09	71.0E-09	74.7E-09	55.7E-09	50.9E-09	74.8E-09	91.7E-09
ON samples								
2	-41.5E-09	27.1E-09	68.4E-09	67.6E-09	66.5E-09	52.7E-09	72.4E-09	52.4E-09
3	-99.7E-09	-16.3E-09	-38.7E-09	-38.4E-09	-35.7E-09	-58.2E-09	-40.9E-09	-52.4E-09
4	-72.7E-09	-70.1E-09	-2.4E-09	-1.8E-09	-8.3E-09	-12.9E-09	-1.2E-09	-19.6E-09
5	-36.0E-09	-30.5E-09	33.5E-09	44.1E-09	37.0E-09	54.7E-09	40.4E-09	16.0E-09
6	-21.0E-09	-13.3E-09	52.4E-09	52.0E-09	53.5E-09	61.0E-09	54.2E-09	31.4E-09
Statistics								
Min	-99.7E-09	-70.1E-09	-38.7E-09	-38.4E-09	-35.7E-09	-58.2E-09	-40.9E-09	-52.4E-09
Max	-21.0E-09	27.1E-09	68.4E-09	67.6E-09	66.5E-09	61.0E-09	72.4E-09	52.4E-09
Average	-54.2E-09	-20.6E-09	22.7E-09	24.7E-09	22.6E-09	19.5E-09	25.0E-09	5.6E-09
Std Deviation	28.3E-09	31.3E-09	38.7E-09	39.1E-09	38.6E-09	47.2E-09	40.9E-09	37.3E-09

Measurements								
los_±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	7.0E-09	48.9E-09	78.5E-09	78.5E-09	78.8E-09	63.6E-09	72.0E-09	80.9E-09
1_OUT_REF	9.0E-09	75.0E-09	71.0E-09	74.7E-09	55.7E-09	50.9E-09	74.8E-09	91.7E-09
OFF samples								
7	-49.6E-09	43.9E-09	-1.9E-09	11.7E-09	7.1E-09	15.0E-09	8.7E-09	-7.9E-09
8	-29.0E-09	-27.9E-09	26.2E-09	31.0E-09	31.3E-09	47.7E-09	34.4E-09	-4.7E-09
9	-52.0E-09	-36.1E-09	12.1E-09	21.8E-09	-9.9E-09	21.5E-09	14.8E-09	9.6E-09
10	-53.0E-09	-30.2E-09	13.0E-09	22.7E-09	11.7E-09	31.6E-09	15.4E-09	3.9E-09
11	-105.2E-09	-66.4E-09	-33.0E-09	-29.5E-09	-22.5E-09	1.5E-09	-21.5E-09	-21.4E-09
Statistics								
Min	-105.2E-09	-66.4E-09	-33.0E-09	-29.5E-09	-22.5E-09	1.5E-09	-21.5E-09	-21.4E-09
Max	-29.0E-09	43.9E-09	26.2E-09	31.0E-09	31.3E-09	47.7E-09	34.4E-09	9.6E-09
Average	-57.8E-09	-23.3E-09	3.3E-09	11.5E-09	3.5E-09	23.4E-09	10.4E-09	-4.1E-09
Std Deviation	25.3E-09	36.3E-09	20.2E-09	21.4E-09	18.5E-09	15.6E-09	18.1E-09	10.6E-09

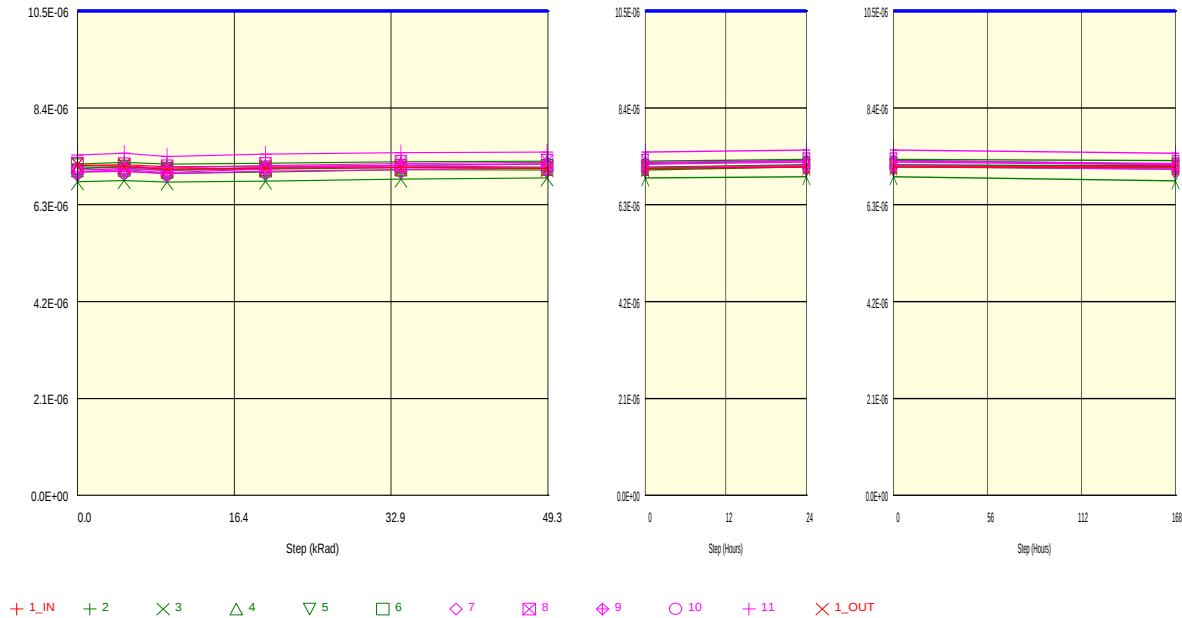
Parameter : Input Bias Current (plus) : lib+ _±5V
Test conditions :
Unit : A
Spec Limit Max : 10.5E-06
Spec limits are represented in bold lines on the graphic.



lib+ _±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1 IN_REF	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06
1 OUT_REF	7.2E-06	7.2E-06	7.1E-06	7.2E-06	7.2E-06	7.1E-06	7.2E-06	7.2E-06
ON samples								
2	7.1E-06	7.3E-06	7.3E-06	7.3E-06	7.3E-06	7.3E-06	7.4E-06	7.3E-06
3	6.7E-06	6.8E-06	6.8E-06	6.8E-06	6.8E-06	6.8E-06	6.9E-06	6.8E-06
4	7.0E-06	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.1E-06	7.3E-06	7.2E-06
5	7.0E-06	7.0E-06	7.0E-06	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.1E-06
6	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06
Statistics								
Min	6.7E-06	6.8E-06	6.8E-06	6.8E-06	6.8E-06	6.8E-06	6.9E-06	6.8E-06
Max	7.1E-06	7.3E-06	7.3E-06	7.3E-06	7.3E-06	7.3E-06	7.4E-06	7.3E-06
Average	7.0E-06	7.0E-06	7.0E-06	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.1E-06
Std Deviation	141.6E-09	142.2E-09	163.1E-09	162.1E-09	156.2E-09	157.8E-09	164.5E-09	182.8E-09

lib+ _±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1 IN_REF	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06
1 OUT_REF	7.2E-06	7.2E-06	7.1E-06	7.2E-06	7.2E-06	7.1E-06	7.2E-06	7.2E-06
OFF samples								
7	7.0E-06	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06
8	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.2E-06	7.3E-06	7.3E-06	7.3E-06
9	7.0E-06	7.0E-06	7.0E-06	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.1E-06
10	7.0E-06	7.0E-06	7.0E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06
11	7.3E-06	7.4E-06	7.3E-06	7.4E-06	7.4E-06	7.5E-06	7.5E-06	7.4E-06
Statistics								
Min	7.0E-06	7.0E-06	7.0E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06
Max	7.3E-06	7.4E-06	7.3E-06	7.4E-06	7.4E-06	7.5E-06	7.5E-06	7.4E-06
Average	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.2E-06	7.2E-06	7.3E-06	7.2E-06
Std Deviation	120.1E-09	125.3E-09	118.1E-09	112.3E-09	112.5E-09	120.0E-09	113.2E-09	107.9E-09

Parameter : Input Bias Current (minus) : lib-_±5V
Test conditions :
Unit : A
Spec Limit Max : 10.5E-06
Spec limits are represented in bold lines on the graphic.

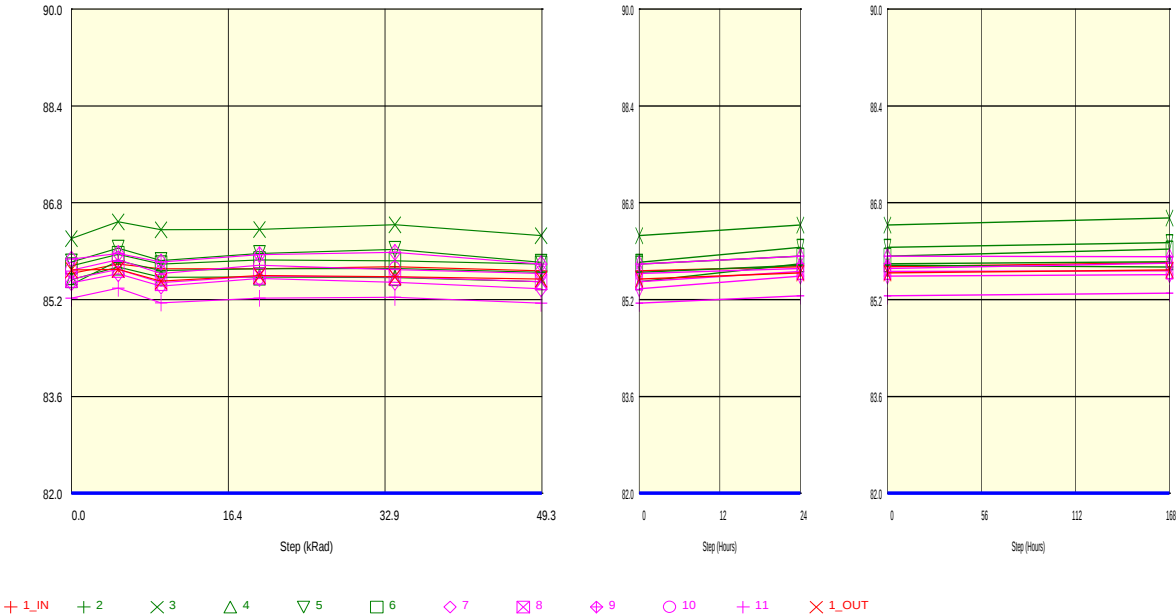


Measurements								
lib-_±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	7.1E-06	7.2E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.2E-06
1_OUT_REF	7.2E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06
ON samples								
2	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.3E-06	7.3E-06
3	6.8E-06	6.8E-06	6.8E-06	6.8E-06	6.9E-06	6.9E-06	6.9E-06	6.8E-06
4	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.2E-06	7.3E-06	7.2E-06
5	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06
6	7.1E-06	7.1E-06	7.0E-06	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.1E-06
Statistics								
Min	6.8E-06	6.8E-06	6.8E-06	6.8E-06	6.9E-06	6.9E-06	6.9E-06	6.8E-06
Max	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.3E-06	7.3E-06
Average	7.0E-06	7.1E-06	7.0E-06	7.0E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06
Std Deviation	131.4E-09	131.3E-09	129.3E-09	129.9E-09	127.0E-09	125.3E-09	133.4E-09	149.3E-09

Measurements								
lib-_±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.2E-06
1_OUT_REF	7.2E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06
OFF samples								
7	7.1E-06	7.1E-06	7.0E-06	7.1E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06
8	7.2E-06	7.1E-06	7.1E-06	7.2E-06	7.2E-06	7.2E-06	7.3E-06	7.2E-06
9	7.0E-06	7.1E-06	7.0E-06	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.1E-06
10	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06
11	7.4E-06	7.4E-06	7.3E-06	7.4E-06	7.4E-06	7.4E-06	7.5E-06	7.4E-06
Statistics								
Min	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06
Max	7.4E-06	7.4E-06	7.3E-06	7.4E-06	7.4E-06	7.4E-06	7.5E-06	7.4E-06
Average	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06
Std Deviation	137.5E-09	141.3E-09	133.1E-09	129.4E-09	124.1E-09	127.2E-09	126.6E-09	120.9E-09

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

Parameter : Open Loop Voltage Gain : Av_±5V
 Test conditions :
 Unit : dB
 Spec Limit Min : 82.0
 Spec limits are represented in bold lines on the graphic.



Measurements								
Av_±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	85.6	85.8	85.7	85.7	85.7	85.7	85.7	85.8
1_OUT_REF	85.7	85.7	85.5	85.6	85.6	85.5	85.6	85.7
ON samples								
2	85.4	85.8	85.7	85.7	85.7	85.7	85.8	85.7
3	86.2	86.5	86.4	86.4	86.4	86.3	86.4	86.5
4	85.5	85.7	85.6	85.6	85.6	85.5	85.8	85.8
5	85.8	86.1	85.8	86.0	86.0	85.8	86.1	86.1
6	85.8	85.9	85.8	85.9	85.8	85.8	85.9	86.0
Statistics								
Min	85.4	85.7	85.6	85.6	85.6	85.5	85.8	85.7
Max	86.2	86.5	86.4	86.4	86.4	86.3	86.4	86.5
Average	85.8	86.0	85.8	85.9	85.9	85.8	86.0	86.1
Std Deviation	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3

Measurements								
Av_±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	85.6	85.8	85.7	85.7	85.7	85.7	85.7	85.8
1_OUT_REF	85.7	85.7	85.5	85.6	85.6	85.5	85.6	85.7
OFF samples								
7	85.5	85.6	85.4	85.5	85.5	85.4	85.6	85.6
8	85.5	85.7	85.5	85.6	85.6	85.5	85.7	85.7
9	85.9	86.0	85.8	85.9	86.0	85.8	85.9	85.9
10	85.7	85.9	85.6	85.8	85.7	85.6	85.7	85.8
11	85.2	85.4	85.1	85.2	85.2	85.1	85.3	85.3
Statistics								
Min	85.2	85.4	85.1	85.2	85.2	85.1	85.3	85.3
Max	85.9	86.0	85.8	85.9	86.0	85.8	85.9	85.9
Average	85.6	85.7	85.5	85.6	85.6	85.5	85.6	85.7
Std Deviation	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

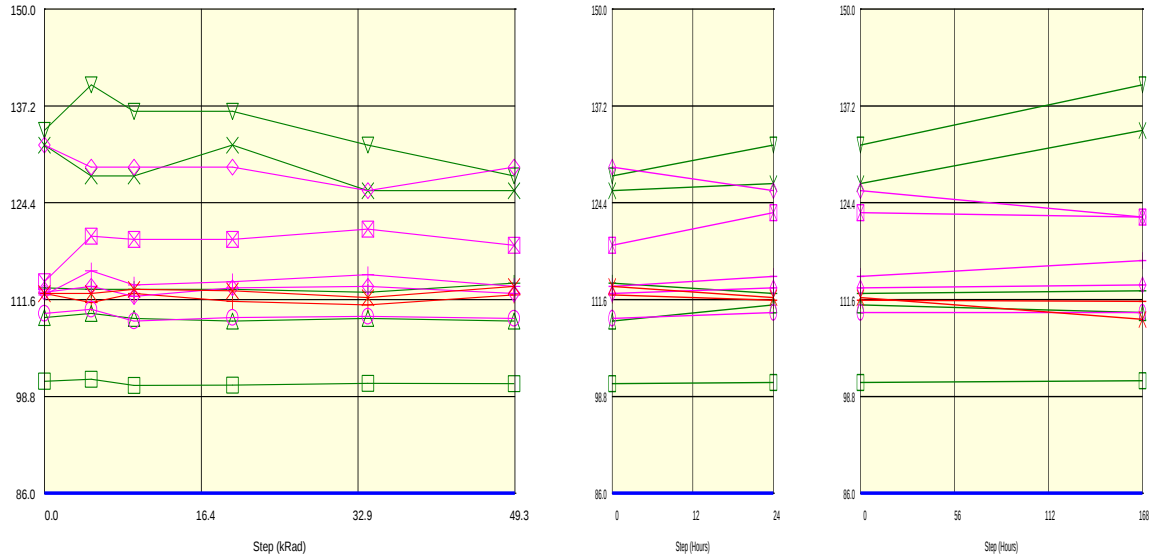
Parameter : Common Mode Rejection Ratio : CMRR_±5V

Test conditions : Vcm = ±4V

Unit : dB

Spec Limit Min : 86.0

Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 × 3 △ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 × 1_OUT

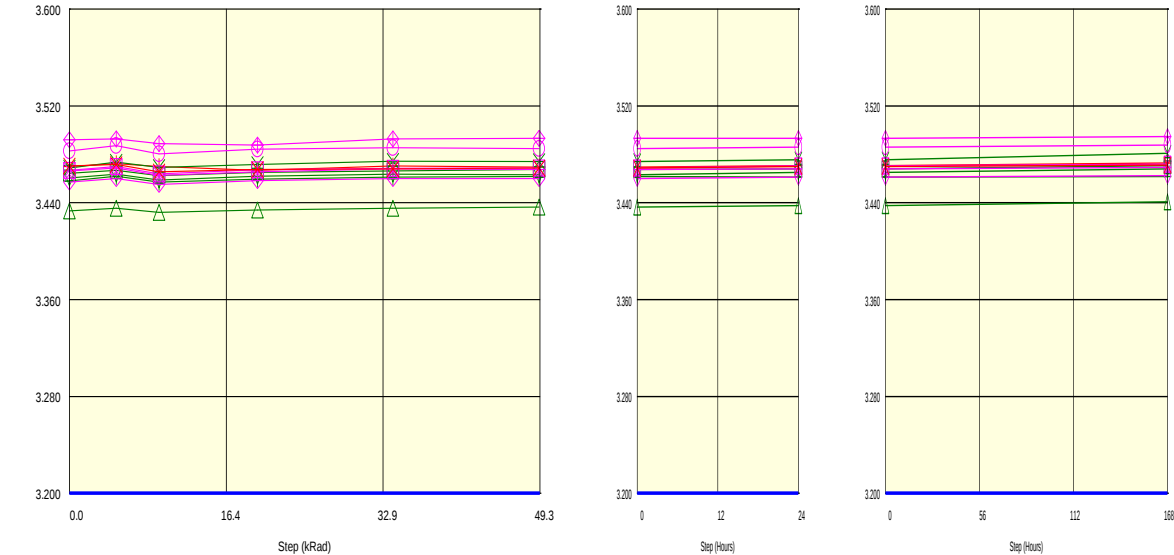
Measurements

CMRR_±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	112.4	111.2	112.4	111.4	110.9	112.2	111.5	111.4
1_OUT_REF	112.4	112.4	113.0	112.8	111.9	113.4	111.9	109.0
ON samples								
2	113.2	113.0	113.0	113.0	112.6	113.8	112.4	112.8
3	132.0	128.0	128.0	132.0	126.0	126.0	126.9	134.0
4	109.2	109.8	109.1	108.8	109.1	108.8	110.9	109.9
5	134.0	140.0	136.5	136.5	132.0	128.0	132.0	140.0
6	100.8	101.1	100.3	100.3	100.5	100.5	100.6	100.9
Statistics								
Min	100.8	101.1	100.3	100.3	100.5	100.5	100.6	100.9
Max	134.0	140.0	136.5	136.5	132.0	128.0	132.0	140.0
Average	117.8	118.3	117.4	118.1	116.1	115.4	116.6	119.5
Std Deviation	13.0	13.9	13.1	13.9	11.5	10.4	11.4	14.9

Measurements

CMRR_±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	112.4	111.2	112.4	111.4	110.9	112.2	111.5	111.4
1_OUT_REF	112.4	112.4	113.0	112.8	111.9	113.4	111.9	109.0
OFF samples								
7	132.0	129.1	129.1	129.1	126.0	129.1	126.0	122.5
8	114.0	120.0	119.6	119.6	120.9	118.8	123.1	122.5
9	112.6	113.4	112.0	113.2	113.4	112.4	113.2	113.6
10	109.8	110.3	108.8	109.2	109.4	109.1	109.9	109.9
11	112.2	115.4	113.6	114.0	114.9	113.4	114.7	116.8
Statistics								
Min	109.8	110.3	108.8	109.2	109.4	109.1	109.9	109.9
Max	132.0	129.1	129.1	129.1	126.0	129.1	126.0	122.5
Average	116.1	117.6	116.6	117.0	116.9	116.6	117.4	117.0
Std Deviation	8.1	6.5	7.2	6.9	5.9	7.0	6.1	5.0

Parameter : Output Voltage Swing (plus) : Vout+ $\pm 5V$
Test conditions :
Unit : V
Spec Limit Min : 3.200
Spec limits are represented in bold lines on the graphic.



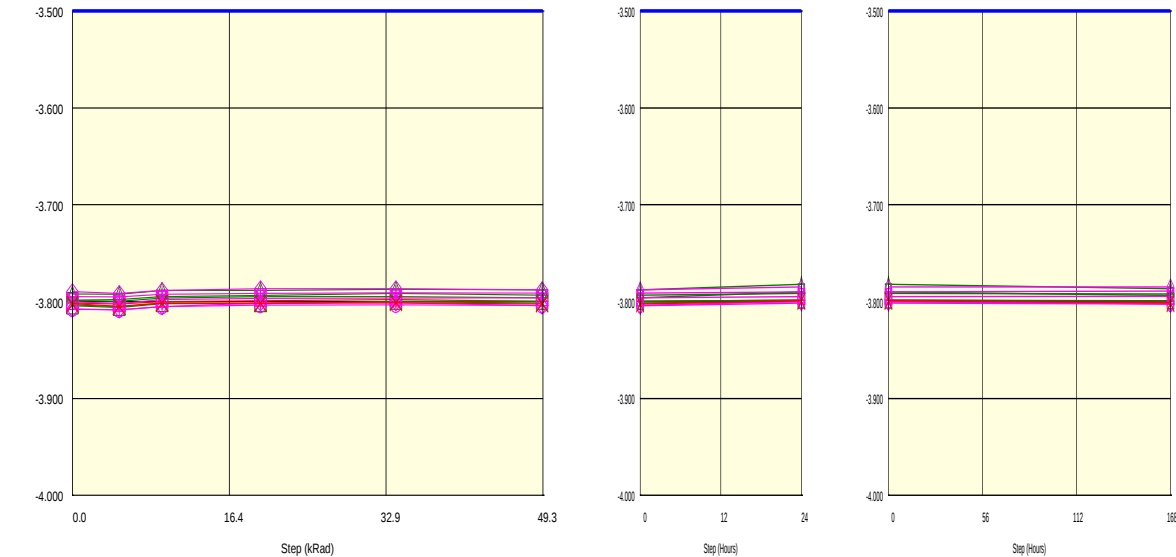
+ 1_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 X 1_OUT

Measurements								
Vout+ $\pm 5V$	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	3.470	3.472	3.470	3.467	3.470	3.470	3.471	3.473
1_OUT_REF	3.470	3.472	3.466	3.468	3.468	3.469	3.470	3.471
ON samples								
2	3.458	3.462	3.457	3.460	3.461	3.462	3.461	3.462
3	3.469	3.474	3.469	3.472	3.474	3.474	3.476	3.481
4	3.433	3.436	3.432	3.434	3.436	3.436	3.438	3.441
5	3.460	3.464	3.459	3.462	3.464	3.463	3.465	3.468
6	3.464	3.467	3.462	3.465	3.466	3.468	3.468	3.471
Statistics								
Min	3.433	3.436	3.432	3.434	3.436	3.436	3.438	3.441
Max	3.469	3.474	3.469	3.472	3.474	3.474	3.476	3.481
Average	3.457	3.460	3.456	3.458	3.460	3.461	3.462	3.464
Std Deviation	0.012	0.013	0.013	0.013	0.013	0.013	0.013	0.013

Measurements								
Vout+ $\pm 5V$	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	3.470	3.472	3.470	3.467	3.470	3.470	3.471	3.473
1_OUT_REF	3.470	3.472	3.466	3.468	3.468	3.469	3.470	3.471
OFF samples								
7	3.457	3.460	3.455	3.458	3.460	3.460	3.461	3.462
8	3.467	3.470	3.464	3.467	3.468	3.469	3.470	3.472
9	3.492	3.493	3.489	3.488	3.493	3.493	3.493	3.495
10	3.483	3.487	3.480	3.484	3.486	3.485	3.486	3.488
11	3.466	3.469	3.463	3.466	3.468	3.468	3.468	3.469
Statistics								
Min	3.457	3.460	3.455	3.458	3.460	3.460	3.461	3.462
Max	3.492	3.493	3.489	3.488	3.493	3.493	3.493	3.495
Average	3.473	3.476	3.470	3.473	3.475	3.475	3.476	3.477
Std Deviation	0.013	0.012	0.012	0.011	0.012	0.012	0.012	0.012

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

Parameter : Output Voltage Swing (minus) : Vout_±5V
Test conditions :
Unit : V
Spec Limit Max : -3.500
Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 × 3 △ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 × 1_OUT

Measurements

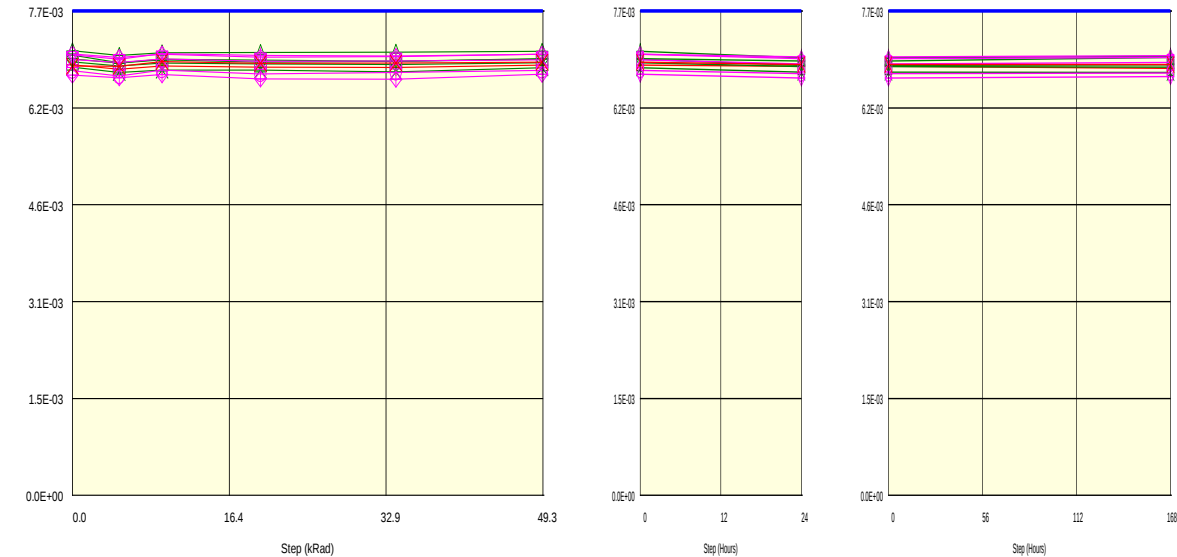
Vout_ ±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	-3.802	-3.802	-3.800	-3.799	-3.798	-3.800	-3.798	-3.800
1_OUT_REF	-3.802	-3.805	-3.802	-3.802	-3.801	-3.802	-3.799	-3.801
ON samples								
2	-3.798	-3.798	-3.795	-3.794	-3.792	-3.793	-3.792	-3.792
3	-3.803	-3.805	-3.802	-3.802	-3.800	-3.802	-3.800	-3.802
4	-3.792	-3.792	-3.788	-3.788	-3.787	-3.788	-3.782	-3.787
5	-3.799	-3.800	-3.796	-3.795	-3.795	-3.796	-3.790	-3.794
6	-3.804	-3.806	-3.802	-3.802	-3.800	-3.800	-3.798	-3.799
Statistics								
Min	-3.804	-3.806	-3.802	-3.802	-3.800	-3.802	-3.800	-3.802
Max	-3.792	-3.792	-3.788	-3.788	-3.787	-3.788	-3.782	-3.787
Average	-3.799	-3.800	-3.797	-3.796	-3.795	-3.796	-3.792	-3.795
Std Deviation	0.004	0.005	0.005	0.005	0.005	0.005	0.006	0.005

Measurements

Vout_ ±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	-3.802	-3.802	-3.800	-3.799	-3.798	-3.800	-3.798	-3.800
1_OUT_REF	-3.802	-3.805	-3.802	-3.802	-3.801	-3.802	-3.799	-3.801
OFF samples								
7	-3.790	-3.792	-3.788	-3.787	-3.787	-3.788	-3.785	-3.785
8	-3.800	-3.802	-3.798	-3.797	-3.796	-3.796	-3.795	-3.794
9	-3.808	-3.808	-3.805	-3.802	-3.801	-3.804	-3.802	-3.802
10	-3.808	-3.808	-3.805	-3.804	-3.803	-3.804	-3.800	-3.802
11	-3.795	-3.795	-3.792	-3.792	-3.791	-3.791	-3.790	-3.789
Statistics								
Min	-3.808	-3.808	-3.805	-3.804	-3.803	-3.804	-3.802	-3.802
Max	-3.790	-3.792	-3.788	-3.787	-3.787	-3.788	-3.785	-3.785
Average	-3.800	-3.801	-3.798	-3.796	-3.796	-3.797	-3.794	-3.795
Std Deviation	0.007	0.007	0.007	0.006	0.006	0.007	0.006	0.007

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

Parameter : Positive Supply Current : Is+EN_±5V
 Test conditions : Output Enabled
 Unit : A
 Spec Limit Max : 7.7E-03
 Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 × 3 △ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 × 1_OUT

Measurements								
Is+EN_±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	6.8E-03	6.8E-03	6.8E-03	6.8E-03	6.8E-03	6.8E-03	6.8E-03	6.8E-03
1_OUT_REF	6.8E-03	6.8E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03
ON samples								
2	7.0E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	7.0E-03
3	6.8E-03	6.7E-03	6.8E-03	6.8E-03	6.7E-03	6.8E-03	6.7E-03	6.7E-03
4	7.1E-03	7.0E-03	7.0E-03	7.0E-03	7.0E-03	7.1E-03	7.0E-03	7.0E-03
5	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.8E-03	6.8E-03
6	6.9E-03	6.8E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.8E-03	6.8E-03
Statistics								
Min	6.8E-03	6.7E-03	6.8E-03	6.8E-03	6.7E-03	6.8E-03	6.7E-03	6.7E-03
Max	7.1E-03	7.0E-03	7.0E-03	7.0E-03	7.0E-03	7.1E-03	7.0E-03	7.0E-03
Average	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03
Std Deviation	89.5E-06	87.0E-06	90.5E-06	90.8E-06	100.3E-06	86.0E-06	78.4E-06	97.4E-06

Measurements								
Is+EN_±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	6.8E-03	6.8E-03	6.8E-03	6.8E-03	6.8E-03	6.8E-03	6.8E-03	6.8E-03
1_OUT_REF	6.8E-03	6.8E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03
OFF samples								
7	7.0E-03	7.0E-03	7.0E-03	7.0E-03	7.0E-03	7.0E-03	6.9E-03	7.0E-03
8	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03
9	6.7E-03	6.6E-03	6.7E-03	6.6E-03	6.6E-03	6.7E-03	6.6E-03	6.7E-03
10	6.8E-03	6.7E-03	6.8E-03	6.7E-03	6.7E-03	6.8E-03	6.7E-03	6.7E-03
11	7.0E-03	6.9E-03	7.0E-03	7.0E-03	7.0E-03	7.0E-03	7.0E-03	7.0E-03
Statistics								
Min	6.7E-03	6.6E-03	6.7E-03	6.6E-03	6.6E-03	6.7E-03	6.6E-03	6.7E-03
Max	7.0E-03	7.0E-03	7.0E-03	7.0E-03	7.0E-03	7.0E-03	7.0E-03	7.0E-03
Average	6.9E-03	6.8E-03	6.9E-03	6.8E-03	6.8E-03	6.9E-03	6.8E-03	6.8E-03
Std Deviation	135.3E-06	136.2E-06	135.5E-06	148.3E-06	146.1E-06	132.3E-06	132.5E-06	132.9E-06

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

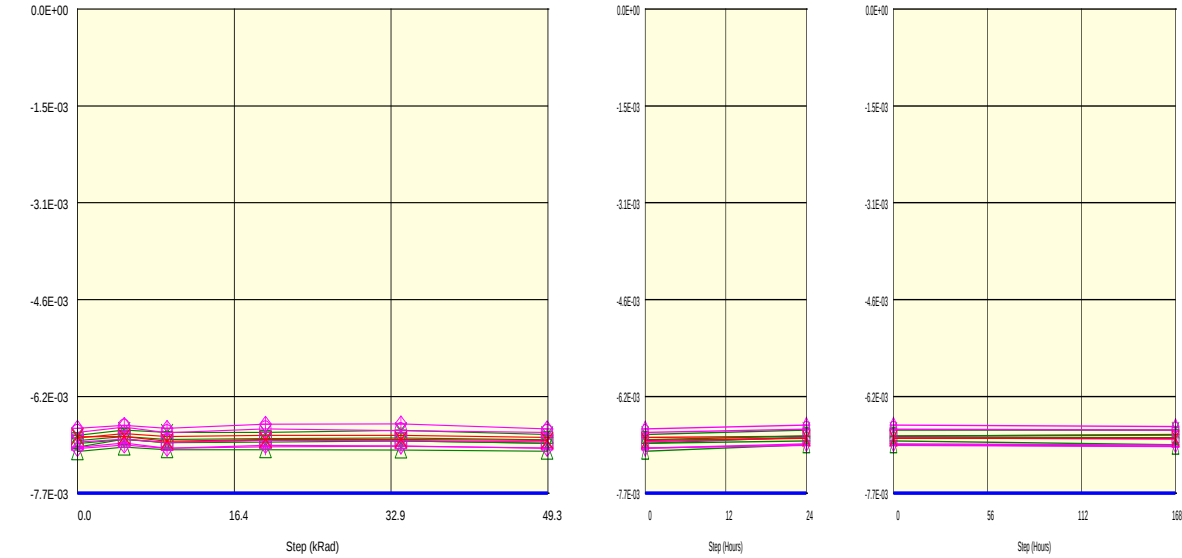
Parameter : Negative Supply Current : Is-EN_±5V

Test conditions : Output Enabled

Unit : A

Spec Limit Min : -7.7E-03

Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 × 3 △ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 × 1_OUT

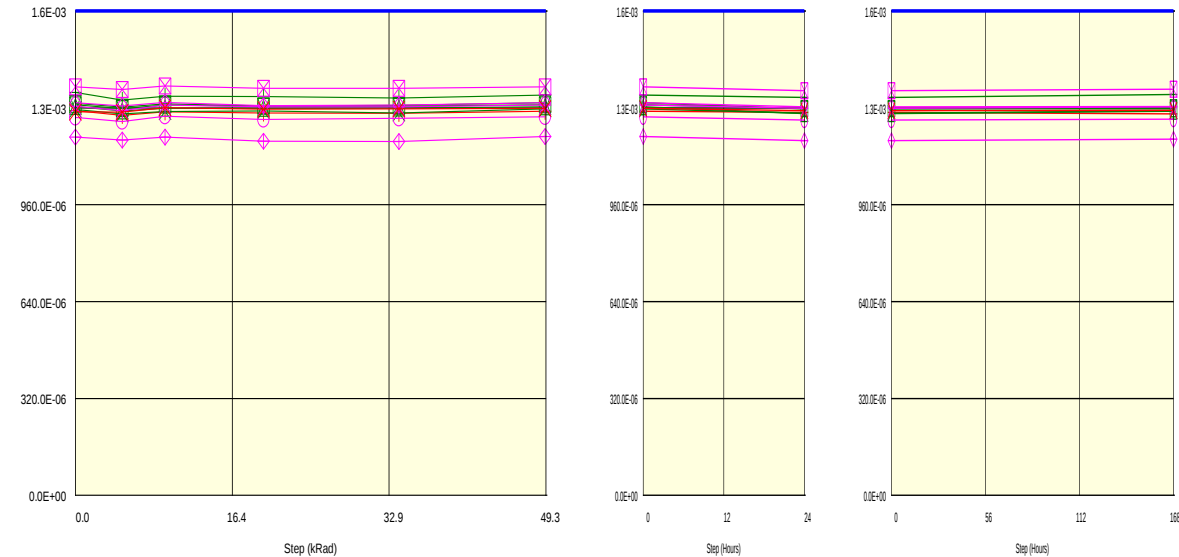
Measurements

Is-EN_±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1 IN_REF	-6.8E-03	-6.8E-03	-6.8E-03	-6.8E-03	-6.8E-03	-6.8E-03	-6.8E-03	-6.8E-03
1 OUT_REF	-6.8E-03	-6.8E-03	-6.9E-03	-6.8E-03	-6.8E-03	-6.9E-03	-6.8E-03	-6.8E-03
ON samples								
2	-7.0E-03	-6.8E-03	-6.9E-03	-6.9E-03	-6.9E-03	-6.9E-03	-6.9E-03	-6.9E-03
3	-6.8E-03	-6.7E-03	-6.7E-03	-6.7E-03	-6.7E-03	-6.8E-03	-6.7E-03	-6.7E-03
4	-7.0E-03	-7.0E-03	-7.0E-03	-7.0E-03	-7.0E-03	-7.0E-03	-6.9E-03	-7.0E-03
5	-6.9E-03	-6.8E-03	-6.9E-03	-6.9E-03	-6.9E-03	-6.9E-03	-6.8E-03	-6.8E-03
6	-6.9E-03	-6.8E-03	-6.8E-03	-6.8E-03	-6.8E-03	-6.8E-03	-6.8E-03	-6.8E-03
Statistics								
Min	-7.0E-03	-7.0E-03	-7.0E-03	-7.0E-03	-7.0E-03	-7.0E-03	-6.9E-03	-7.0E-03
Max	-6.8E-03	-6.7E-03	-6.7E-03	-6.7E-03	-6.7E-03	-6.8E-03	-6.7E-03	-6.7E-03
Average	-6.9E-03	-6.8E-03	-6.9E-03	-6.9E-03	-6.9E-03	-6.9E-03	-6.8E-03	-6.8E-03
Std Deviation	87.9E-06	87.5E-06	89.5E-06	89.8E-06	100.0E-06	85.6E-06	77.7E-06	96.2E-06

Measurements

Is-EN_±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1 IN_REF	-6.8E-03	-6.8E-03	-6.8E-03	-6.8E-03	-6.8E-03	-6.8E-03	-6.8E-03	-6.8E-03
1 OUT_REF	-6.8E-03	-6.8E-03	-6.9E-03	-6.8E-03	-6.8E-03	-6.9E-03	-6.8E-03	-6.8E-03
OFF samples								
7	-7.0E-03	-6.9E-03	-7.0E-03	-6.9E-03	-6.9E-03	-7.0E-03	-6.9E-03	-6.9E-03
8	-6.9E-03	-6.8E-03	-6.9E-03	-6.9E-03	-6.9E-03	-6.9E-03	-6.8E-03	-6.8E-03
9	-6.7E-03	-6.6E-03	-6.7E-03	-6.6E-03	-6.6E-03	-6.7E-03	-6.6E-03	-6.6E-03
10	-6.7E-03	-6.6E-03	-6.7E-03	-6.7E-03	-6.7E-03	-6.7E-03	-6.7E-03	-6.7E-03
11	-7.0E-03	-6.9E-03	-7.0E-03	-7.0E-03	-7.0E-03	-7.0E-03	-6.9E-03	-7.0E-03
Statistics								
Min	-7.0E-03	-6.9E-03	-7.0E-03	-7.0E-03	-7.0E-03	-7.0E-03	-6.9E-03	-7.0E-03
Max	-6.7E-03	-6.6E-03	-6.7E-03	-6.6E-03	-6.6E-03	-6.7E-03	-6.6E-03	-6.6E-03
Average	-6.8E-03	-6.8E-03	-6.9E-03	-6.8E-03	-6.8E-03	-6.9E-03	-6.8E-03	-6.8E-03
Std Deviation	128.9E-06	130.2E-06	129.4E-06	142.2E-06	140.8E-06	126.9E-06	127.1E-06	127.0E-06

Parameter : Positive Supply Current : Is+DIS_±5V
Test conditions : Output Disabled
Unit : A
Spec Limit Max : 1.6E-03
Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 × 3 △ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 × 1_OUT

Measurements

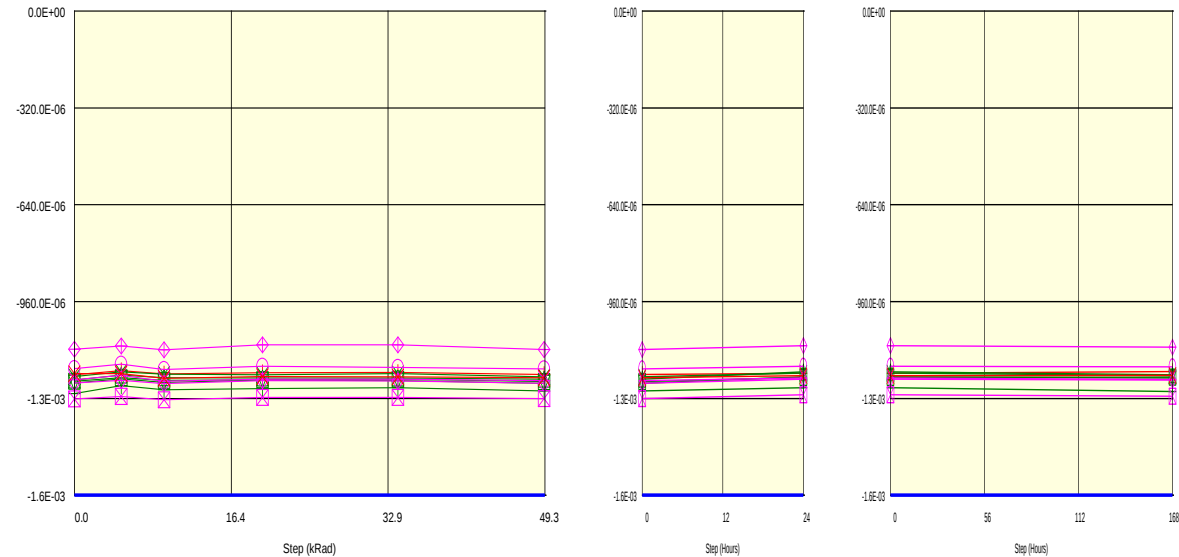
Is+DIS_±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03
1_OUT_REF	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03
ON samples								
2	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03
3	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03
4	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03
5	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03
6	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03
Statistics								
Min	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03
Max	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03
Average	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03
Std Deviation	19.5E-06	15.1E-06	16.9E-06	16.0E-06	16.0E-06	15.7E-06	19.2E-06	20.5E-06

Measurements

Is+DIS_±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03
1_OUT_REF	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03
OFF samples								
7	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03
8	1.4E-03	1.3E-03	1.4E-03	1.3E-03	1.3E-03	1.4E-03	1.3E-03	1.3E-03
9	1.2E-03	1.2E-03	1.2E-03	1.2E-03	1.2E-03	1.2E-03	1.2E-03	1.2E-03
10	1.2E-03	1.2E-03	1.3E-03	1.2E-03	1.2E-03	1.3E-03	1.2E-03	1.2E-03
11	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03
Statistics								
Min	1.2E-03	1.2E-03	1.2E-03	1.2E-03	1.2E-03	1.2E-03	1.2E-03	1.2E-03
Max	1.4E-03	1.3E-03	1.4E-03	1.3E-03	1.3E-03	1.4E-03	1.3E-03	1.3E-03
Average	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03
Std Deviation	55.1E-06	55.4E-06	55.7E-06	58.2E-06	58.3E-06	54.5E-06	54.8E-06	54.6E-06

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

Parameter : Negative Supply Current : Is-DIS_±5V
 Test conditions : Output Disabled
 Unit : A
 Spec Limit Min : -1.6E-03
 Spec limits are represented in bold lines on the graphic.



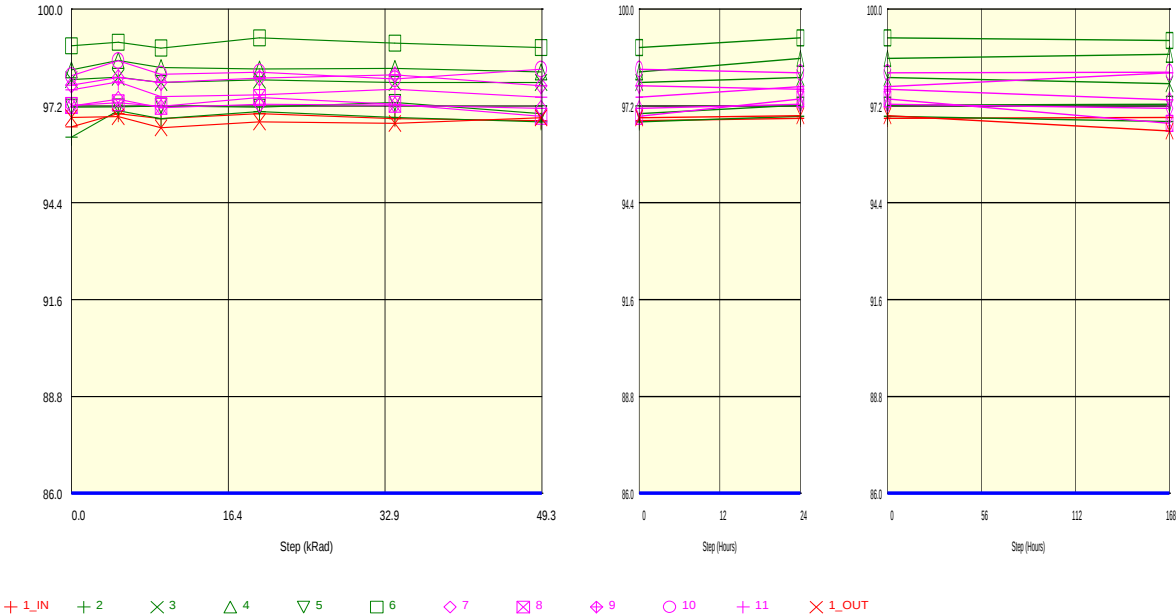
+ 1_IN + 2 × 3 △ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 × 1_OUT

Measurements								
Is-DIS ±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03
1_OUT_REF	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03
ON samples								
2	-1.3E-03	-1.2E-03	-1.3E-03	-1.2E-03	-1.2E-03	-1.3E-03	-1.2E-03	-1.3E-03
3	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03
4	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03
5	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03
6	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03
Statistics								
Min	-1.3E-03	-1.2E-03	-1.3E-03	-1.2E-03	-1.2E-03	-1.3E-03	-1.2E-03	-1.3E-03
Max	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03
Average	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03
Std Deviation	19.0E-06	15.1E-06	17.2E-06	15.2E-06	15.1E-06	15.8E-06	18.6E-06	20.4E-06

Measurements								
Is-DIS ±5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03
1_OUT_REF	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03
OFF samples								
7	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03
8	-1.3E-03	-1.3E-03	-1.3E-03	-1.3E-03	-1.3E-03	-1.3E-03	-1.3E-03	-1.3E-03
9	-1.1E-03	-1.1E-03	-1.1E-03	-1.1E-03	-1.1E-03	-1.1E-03	-1.1E-03	-1.1E-03
10	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03
11	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03
Statistics								
Min	-1.3E-03	-1.3E-03	-1.3E-03	-1.3E-03	-1.3E-03	-1.3E-03	-1.3E-03	-1.3E-03
Max	-1.1E-03	-1.1E-03	-1.1E-03	-1.1E-03	-1.1E-03	-1.1E-03	-1.1E-03	-1.1E-03
Average	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03	-1.2E-03
Std Deviation	54.5E-06	55.4E-06	54.8E-06	57.6E-06	57.6E-06	54.0E-06	54.0E-06	54.0E-06

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

Parameter : Power Supply Rejection Ratio (plus) : PSRR+ $\pm 5V$
 Test conditions : Vcc = +4V to +6V. Vee = -5V
 Unit : dB
 Spec Limit Min : 86.0
 Spec limits are represented in bold lines on the graphic.

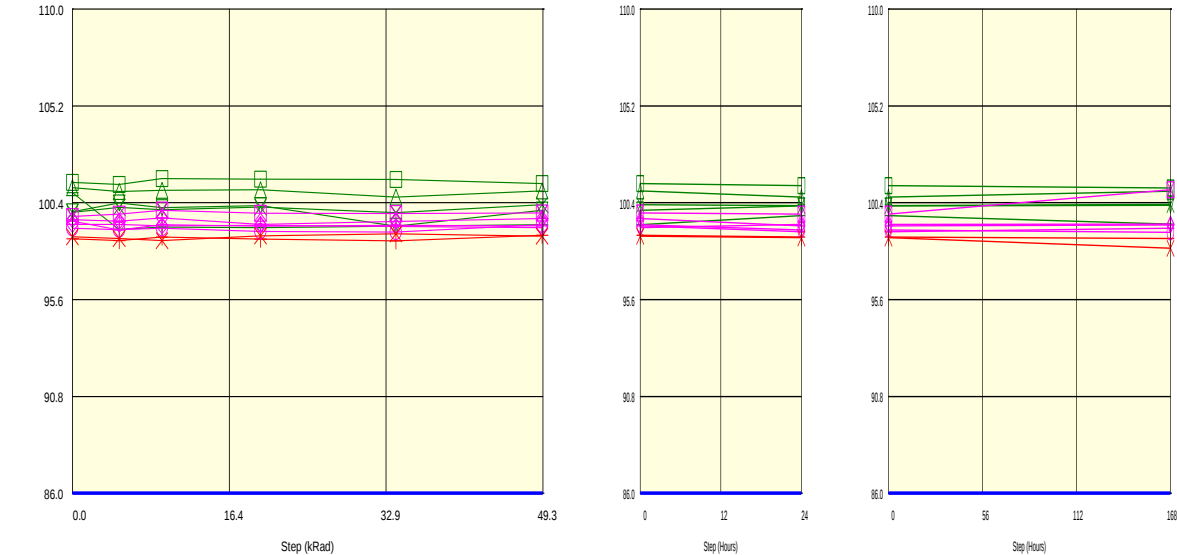


PSRR+ $\pm 5V$	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	96.6	97.0	96.8	97.0	96.8	96.8	96.8	96.9
1_OUT_REF	96.9	96.9	96.6	96.7	96.7	96.9	96.9	96.5
ON samples								
2	96.3	97.1	96.8	97.0	96.9	96.7	96.9	96.7
3	98.0	98.0	97.9	98.0	97.9	97.9	98.0	97.8
4	98.2	98.5	98.3	98.3	98.3	98.2	98.6	98.7
5	97.2	97.2	97.2	97.2	97.3	97.0	97.2	97.3
6	98.9	99.0	98.9	99.2	99.0	98.9	99.2	99.1
Statistics								
Min	96.3	97.1	96.8	97.0	96.9	96.7	96.9	96.7
Max	98.9	99.0	98.9	99.2	99.0	98.9	99.2	99.1
Average	97.7	98.0	97.8	97.9	97.9	97.7	98.0	97.9
Std Deviation	0.9	0.8	0.7	0.8	0.7	0.8	0.8	0.9

PSRR+ $\pm 5V$	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	96.6	97.0	96.8	97.0	96.8	96.8	96.8	96.9
1_OUT_REF	96.9	96.9	96.6	96.7	96.7	96.9	96.9	96.5
OFF samples								
7	97.2	97.4	97.2	97.3	97.2	97.1	97.3	97.1
8	97.2	97.3	97.2	97.4	97.3	96.9	97.4	96.7
9	97.8	98.0	97.9	98.0	98.1	97.8	97.7	97.4
10	98.1	98.5	98.1	98.2	98.0	98.3	98.2	98.2
11	97.7	97.9	97.5	97.5	97.7	97.5	97.8	98.2
Statistics								
Min	97.2	97.3	97.2	97.3	97.2	96.9	97.3	96.7
Max	98.1	98.5	98.1	98.2	98.1	98.3	98.2	98.2
Average	97.6	97.8	97.6	97.7	97.6	97.5	97.7	97.5
Std Deviation	0.3	0.4	0.4	0.4	0.4	0.5	0.3	0.6

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

Parameter : Power Supply Rejection Ratio (minus) : PSRR- $\pm 5V$
 Test conditions : Vcc = 5V. Vee = -6V to -4V
 Unit : dB
 Spec Limit Min : 86.0
 Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 x 3 4 5 6 7 8 9 10 + 11 x 1_OUT

PSRR- $\pm 5V$	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	98.6	98.5	98.7	98.6	98.5	98.8	98.7	98.6
1_OUT_REF	98.7	98.6	98.5	98.8	98.9	98.7	98.7	98.1
ON samples								
2	100.9	99.1	99.2	99.2	99.2	99.3	99.8	99.3
3	99.9	100.2	100.1	100.2	99.9	100.3	100.3	100.3
4	101.1	101.0	101.0	101.1	100.7	101.0	100.7	101.0
5	99.9	100.4	100.2	100.3	99.2	100.0	100.2	100.3
6	101.4	101.3	101.6	101.6	101.6	101.4	101.2	101.1
Statistics								
Min	99.9	99.1	99.2	99.2	99.2	99.3	99.8	99.3
Max	101.4	101.3	101.6	101.6	101.6	101.4	101.2	101.1
Average	100.7	100.4	100.4	100.5	100.1	100.4	100.4	100.4
Std Deviation	0.6	0.8	0.8	0.8	0.9	0.7	0.5	0.6

PSRR- $\pm 5V$	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	98.6	98.5	98.7	98.6	98.5	98.8	98.7	98.6
1_OUT_REF	98.7	98.6	98.5	98.8	98.9	98.7	98.7	98.1
OFF samples								
7	99.3	99.3	99.3	99.3	99.2	99.2	99.3	99.3
8	99.7	99.8	100.0	99.9	99.9	99.9	99.8	101.1
9	99.6	99.5	99.6	99.3	99.5	99.6	99.3	99.3
10	99.1	99.1	99.1	99.0	99.0	99.3	99.0	98.9
11	99.5	99.0	99.3	99.2	99.3	99.3	99.0	99.1
Statistics								
Min	99.1	99.0	99.1	99.0	99.0	99.2	99.0	98.9
Max	99.7	99.8	100.0	99.9	99.9	99.9	99.8	101.1
Average	99.4	99.4	99.5	99.3	99.4	99.5	99.3	99.6
Std Deviation	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.8

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

Parameter : Input Offset Voltage : Vos_±12V

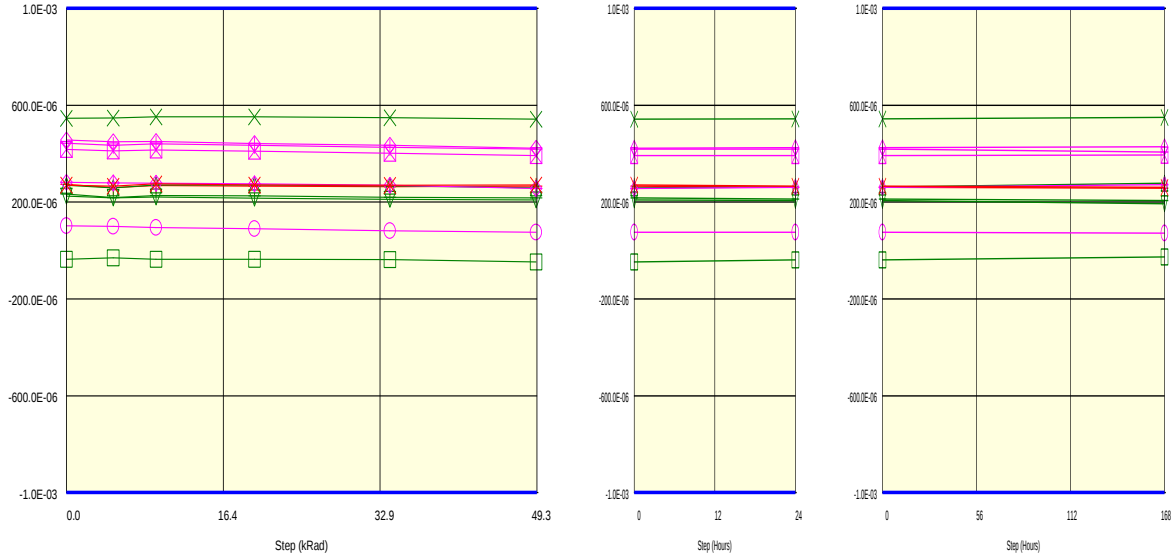
Test conditions :

Unit : V

Spec Limit Min : -1.0E-03

Spec Limit Max : 1.0E-03

Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 × 3 △ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 × 1_OUT

Measurements

Vos_±12V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	273.7E-06	260.5E-06	268.5E-06	266.4E-06	263.4E-06	265.6E-06	260.9E-06	257.8E-06
1_OUT_REF	270.3E-06	266.0E-06	275.4E-06	271.4E-06	269.1E-06	271.3E-06	265.6E-06	261.2E-06
ON samples								
2	233.2E-06	219.3E-06	226.7E-06	226.0E-06	220.2E-06	217.5E-06	213.2E-06	206.3E-06
3	546.8E-06	547.8E-06	552.1E-06	552.2E-06	549.3E-06	543.3E-06	543.8E-06	549.9E-06
4	269.2E-06	258.9E-06	271.2E-06	270.6E-06	266.7E-06	259.2E-06	263.0E-06	277.7E-06
5	224.4E-06	218.1E-06	221.6E-06	216.9E-06	211.3E-06	208.9E-06	206.8E-06	193.3E-06
6	-36.6E-06	-30.0E-06	-36.0E-06	-36.3E-06	-37.4E-06	-47.5E-06	-39.2E-06	-26.6E-06
Statistics								
Min	-36.6E-06	-30.0E-06	-36.0E-06	-36.3E-06	-37.4E-06	-47.5E-06	-39.2E-06	-26.6E-06
Max	546.8E-06	547.8E-06	552.1E-06	552.2E-06	549.3E-06	543.3E-06	543.8E-06	549.9E-06
Average	247.4E-06	242.8E-06	247.1E-06	245.9E-06	242.0E-06	236.3E-06	237.5E-06	240.1E-06
Std Deviation	185.2E-06	183.8E-06	187.0E-06	187.2E-06	186.8E-06	187.9E-06	185.8E-06	185.4E-06

Measurements

Vos_±12V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	273.7E-06	260.5E-06	268.5E-06	266.4E-06	263.4E-06	265.6E-06	260.9E-06	257.8E-06
1_OUT_REF	270.3E-06	266.0E-06	275.4E-06	271.4E-06	269.1E-06	271.3E-06	265.6E-06	261.2E-06
OFF samples								
7	456.4E-06	449.9E-06	450.8E-06	442.4E-06	435.2E-06	422.2E-06	425.3E-06	429.1E-06
8	418.0E-06	411.7E-06	415.2E-06	410.8E-06	401.5E-06	392.3E-06	392.7E-06	394.2E-06
9	281.8E-06	279.2E-06	277.9E-06	276.2E-06	269.8E-06	256.7E-06	261.5E-06	272.0E-06
10	102.1E-06	99.8E-06	94.4E-06	90.4E-06	81.7E-06	75.0E-06	75.8E-06	72.4E-06
11	443.4E-06	434.6E-06	441.3E-06	434.6E-06	426.6E-06	419.5E-06	418.7E-06	406.9E-06
Statistics								
Min	102.1E-06	99.8E-06	94.4E-06	90.4E-06	81.7E-06	75.0E-06	75.8E-06	72.4E-06
Max	456.4E-06	449.9E-06	450.8E-06	442.4E-06	435.2E-06	422.2E-06	425.3E-06	429.1E-06
Average	340.3E-06	335.0E-06	335.9E-06	330.9E-06	323.0E-06	313.2E-06	314.8E-06	314.9E-06
Std Deviation	134.4E-06	132.3E-06	135.9E-06	134.5E-06	134.6E-06	133.7E-06	133.5E-06	133.0E-06

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

Parameter : Input Offset Current : **ios_±12V**

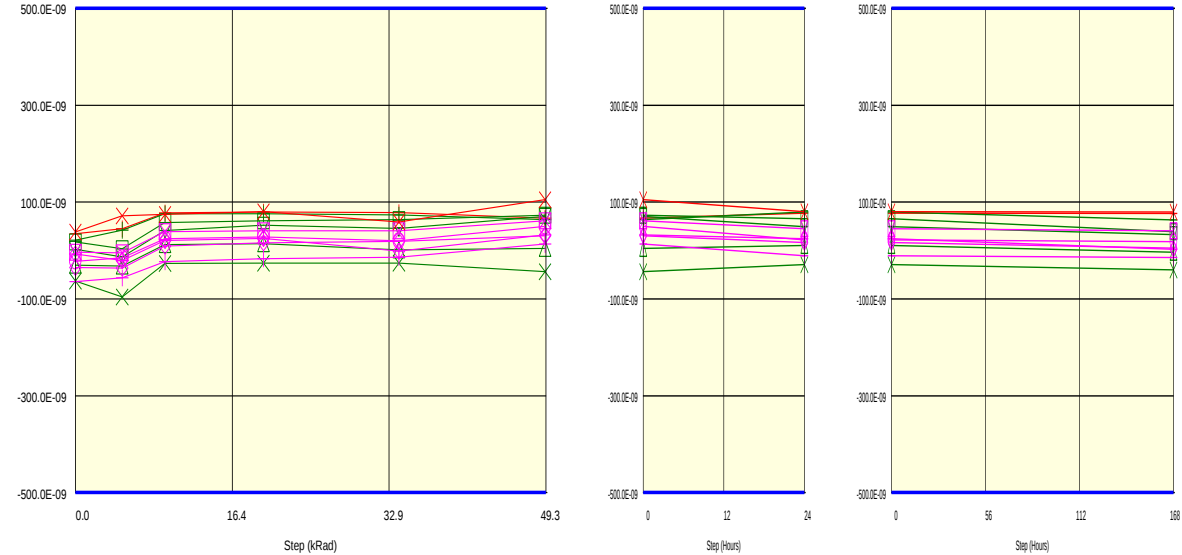
Test conditions :

Unit : A

Spec Limit Min : -500.0E-09

Spec Limit Max : 500.0E-09

Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 × 3 △ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 × 1_OUT

Measurements

ios_±12V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	34.6E-09	45.0E-09	77.8E-09	79.6E-09	78.7E-09	67.1E-09	77.0E-09	76.7E-09
1_OUT_REF	38.6E-09	72.0E-09	74.8E-09	80.3E-09	58.8E-09	105.2E-09	80.0E-09	79.7E-09
ON samples								
2	21.6E-09	41.8E-09	75.7E-09	76.0E-09	73.3E-09	63.6E-09	79.6E-09	63.1E-09
3	-63.2E-09	-95.6E-09	-26.7E-09	-25.8E-09	-26.1E-09	-43.4E-09	-28.7E-09	-40.0E-09
4	-30.4E-09	-32.0E-09	12.4E-09	14.2E-09	1.6E-09	4.6E-09	10.2E-09	-3.3E-09
5	2.4E-09	-13.5E-09	41.2E-09	52.3E-09	45.9E-09	70.5E-09	49.5E-09	32.7E-09
6	17.9E-09	3.6E-09	58.1E-09	61.5E-09	63.7E-09	73.0E-09	65.5E-09	39.0E-09
Statistics								
Min	-63.2E-09	-95.6E-09	-26.7E-09	-25.8E-09	-26.1E-09	-43.4E-09	-28.7E-09	-40.0E-09
Max	21.6E-09	41.8E-09	75.7E-09	76.0E-09	73.3E-09	73.0E-09	79.6E-09	63.1E-09
Average	-10.4E-09	-19.1E-09	32.1E-09	35.6E-09	31.7E-09	33.7E-09	35.2E-09	18.3E-09
Std Deviation	32.2E-09	45.3E-09	36.1E-09	36.9E-09	38.0E-09	46.0E-09	39.5E-09	36.1E-09

Measurements

ios_±12V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	34.6E-09	45.0E-09	77.8E-09	79.6E-09	78.7E-09	67.1E-09	77.0E-09	76.7E-09
1_OUT_REF	38.6E-09	72.0E-09	74.8E-09	80.3E-09	58.8E-09	105.2E-09	80.0E-09	79.7E-09
OFF samples								
7	-34.9E-09	-36.1E-09	9.5E-09	15.7E-09	18.7E-09	30.7E-09	16.6E-09	5.2E-09
8	-3.8E-09	-4.6E-09	38.8E-09	40.9E-09	41.0E-09	61.5E-09	45.2E-09	41.0E-09
9	-7.2E-09	-20.4E-09	20.7E-09	25.2E-09	-1.2E-09	32.0E-09	24.3E-09	2.7E-09
10	-22.4E-09	-15.0E-09	24.3E-09	27.9E-09	20.1E-09	50.1E-09	22.2E-09	18.1E-09
11	-63.9E-09	-56.1E-09	-23.0E-09	-16.7E-09	-13.6E-09	13.2E-09	-10.7E-09	-14.7E-09
Statistics								
Min	-63.9E-09	-56.1E-09	-23.0E-09	-16.7E-09	-13.6E-09	13.2E-09	-10.7E-09	-14.7E-09
Max	-3.8E-09	-4.6E-09	38.8E-09	40.9E-09	41.0E-09	61.5E-09	45.2E-09	41.0E-09
Average	-26.4E-09	-26.5E-09	14.1E-09	18.6E-09	13.0E-09	37.5E-09	19.5E-09	10.5E-09
Std Deviation	21.8E-09	18.0E-09	20.8E-09	19.4E-09	18.9E-09	16.7E-09	17.9E-09	18.5E-09

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

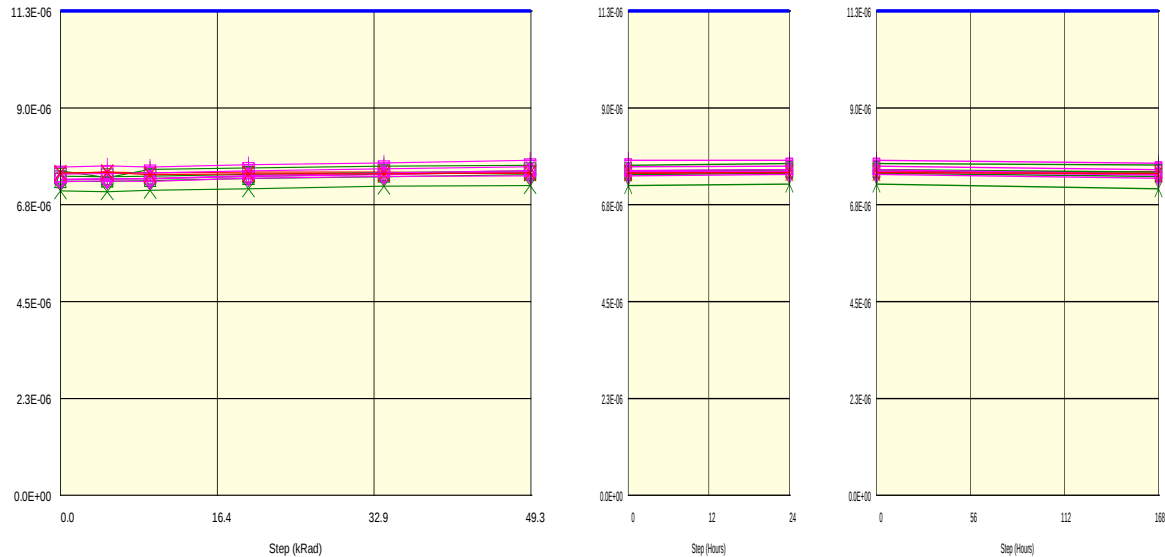
Parameter : Input Bias Current (plus) : lib+ _±12V

Test conditions :

Unit : A

Spec Limit Max : 11.3E-06

Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 X 1_OUT

Measurements

lib+ _±12V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.6E-06	7.6E-06
1_OUT_REF	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06
ON samples								
2	7.6E-06	7.4E-06	7.6E-06	7.6E-06	7.7E-06	7.7E-06	7.7E-06	7.7E-06
3	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.2E-06	7.2E-06	7.3E-06	7.2E-06
4	7.4E-06	7.4E-06	7.4E-06	7.4E-06	7.5E-06	7.5E-06	7.6E-06	7.5E-06
5	7.3E-06	7.3E-06	7.3E-06	7.4E-06	7.4E-06	7.5E-06	7.5E-06	7.4E-06
6	7.4E-06	7.4E-06	7.4E-06	7.5E-06	7.5E-06	7.6E-06	7.6E-06	7.5E-06
Statistics								
Min	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.2E-06	7.2E-06	7.3E-06	7.2E-06
Max	7.6E-06	7.4E-06	7.6E-06	7.6E-06	7.7E-06	7.7E-06	7.7E-06	7.7E-06
Average	7.4E-06	7.3E-06	7.4E-06	7.4E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06
Std Deviation	154.6E-09	127.6E-09	159.6E-09	157.6E-09	153.1E-09	155.6E-09	157.6E-09	181.1E-09

Measurements

lib+ _±12V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.6E-06	7.6E-06
1_OUT_REF	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06
OFF samples								
7	7.4E-06	7.4E-06	7.4E-06	7.5E-06	7.5E-06	7.6E-06	7.6E-06	7.5E-06
8	7.5E-06	7.5E-06	7.5E-06	7.6E-06	7.6E-06	7.7E-06	7.7E-06	7.6E-06
9	7.3E-06	7.3E-06	7.3E-06	7.4E-06	7.4E-06	7.5E-06	7.5E-06	7.4E-06
10	7.4E-06	7.4E-06	7.4E-06	7.4E-06	7.5E-06	7.5E-06	7.6E-06	7.5E-06
11	7.7E-06	7.7E-06	7.7E-06	7.7E-06	7.8E-06	7.8E-06	7.8E-06	7.7E-06
Statistics								
Min	7.3E-06	7.3E-06	7.3E-06	7.4E-06	7.4E-06	7.5E-06	7.5E-06	7.4E-06
Max	7.7E-06	7.7E-06	7.7E-06	7.7E-06	7.8E-06	7.8E-06	7.8E-06	7.7E-06
Average	7.4E-06	7.5E-06	7.5E-06	7.5E-06	7.6E-06	7.6E-06	7.6E-06	7.5E-06
Std Deviation	122.3E-09	126.4E-09	118.9E-09	114.9E-09	111.8E-09	122.2E-09	113.8E-09	119.5E-09

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

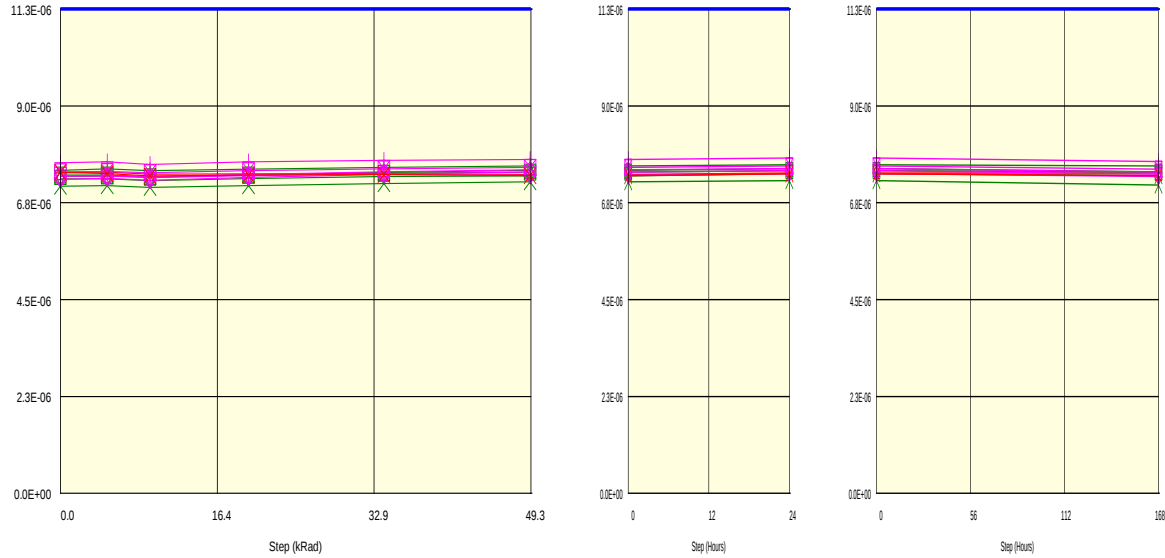
Parameter : Input Bias Current (minus) : lib- $\pm 12V$

Test conditions :

Unit : A

Spec Limit Max : 11.3E-06

Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 10 + 11 X 1_OUT

Measurements

lib- $\pm 12V$	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1 IN_REF	7.5E-06	7.5E-06	7.4E-06	7.5E-06	7.5E-06	7.4E-06	7.5E-06	7.5E-06
1 OUT_REF	7.5E-06	7.5E-06	7.4E-06	7.4E-06	7.4E-06	7.4E-06	7.5E-06	7.4E-06
ON samples								
2	7.5E-06	7.6E-06	7.5E-06	7.6E-06	7.6E-06	7.6E-06	7.7E-06	7.6E-06
3	7.2E-06	7.2E-06	7.1E-06	7.2E-06	7.2E-06	7.3E-06	7.3E-06	7.2E-06
4	7.4E-06	7.4E-06	7.4E-06	7.4E-06	7.5E-06	7.5E-06	7.6E-06	7.5E-06
5	7.3E-06	7.3E-06	7.3E-06	7.3E-06	7.4E-06	7.4E-06	7.5E-06	7.4E-06
6	7.4E-06	7.4E-06	7.4E-06	7.4E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06
Statistics								
Min	7.2E-06	7.2E-06	7.1E-06	7.2E-06	7.2E-06	7.3E-06	7.3E-06	7.2E-06
Max	7.5E-06	7.6E-06	7.5E-06	7.6E-06	7.6E-06	7.6E-06	7.7E-06	7.6E-06
Average	7.4E-06	7.4E-06	7.3E-06	7.4E-06	7.4E-06	7.5E-06	7.5E-06	7.4E-06
Std Deviation	123.5E-09	128.1E-09	127.4E-09	125.6E-09	126.4E-09	124.1E-09	124.4E-09	146.9E-09

Measurements

lib- $\pm 12V$	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1 IN_REF	7.5E-06	7.5E-06	7.4E-06	7.5E-06	7.5E-06	7.4E-06	7.5E-06	7.5E-06
1 OUT_REF	7.5E-06	7.5E-06	7.4E-06	7.4E-06	7.4E-06	7.4E-06	7.5E-06	7.4E-06
OFF samples								
7	7.4E-06	7.4E-06	7.4E-06	7.4E-06	7.5E-06	7.6E-06	7.6E-06	7.5E-06
8	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.6E-06	7.6E-06	7.6E-06	7.6E-06
9	7.3E-06	7.4E-06	7.3E-06	7.4E-06	7.4E-06	7.4E-06	7.5E-06	7.4E-06
10	7.4E-06	7.4E-06	7.4E-06	7.4E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06
11	7.7E-06	7.7E-06	7.7E-06	7.7E-06	7.8E-06	7.8E-06	7.8E-06	7.7E-06
Statistics								
Min	7.3E-06	7.4E-06	7.3E-06	7.4E-06	7.4E-06	7.4E-06	7.5E-06	7.4E-06
Max	7.7E-06	7.7E-06	7.7E-06	7.7E-06	7.8E-06	7.8E-06	7.8E-06	7.7E-06
Average	7.5E-06	7.5E-06	7.4E-06	7.5E-06	7.5E-06	7.6E-06	7.6E-06	7.5E-06
Std Deviation	135.6E-09	136.4E-09	130.2E-09	128.8E-09	120.0E-09	126.0E-09	123.7E-09	122.3E-09

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

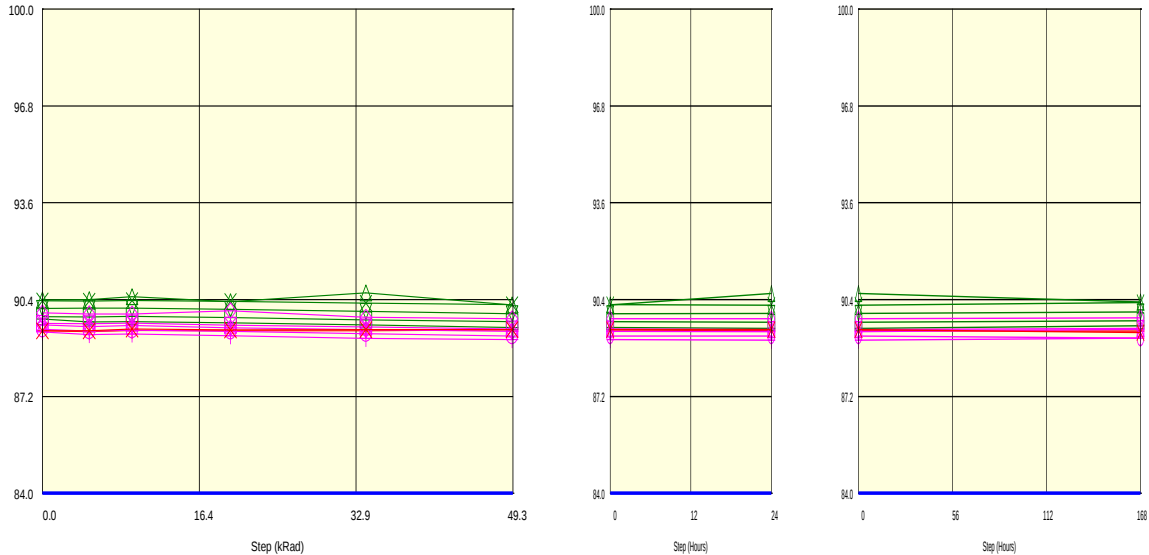
Parameter : Open Loop Voltage Gain : $A_{v_±12V}$

Test conditions :

Unit : dB

Spec Limit Min : 84.0

Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 × 3 △ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 × 1_OUT

Measurements

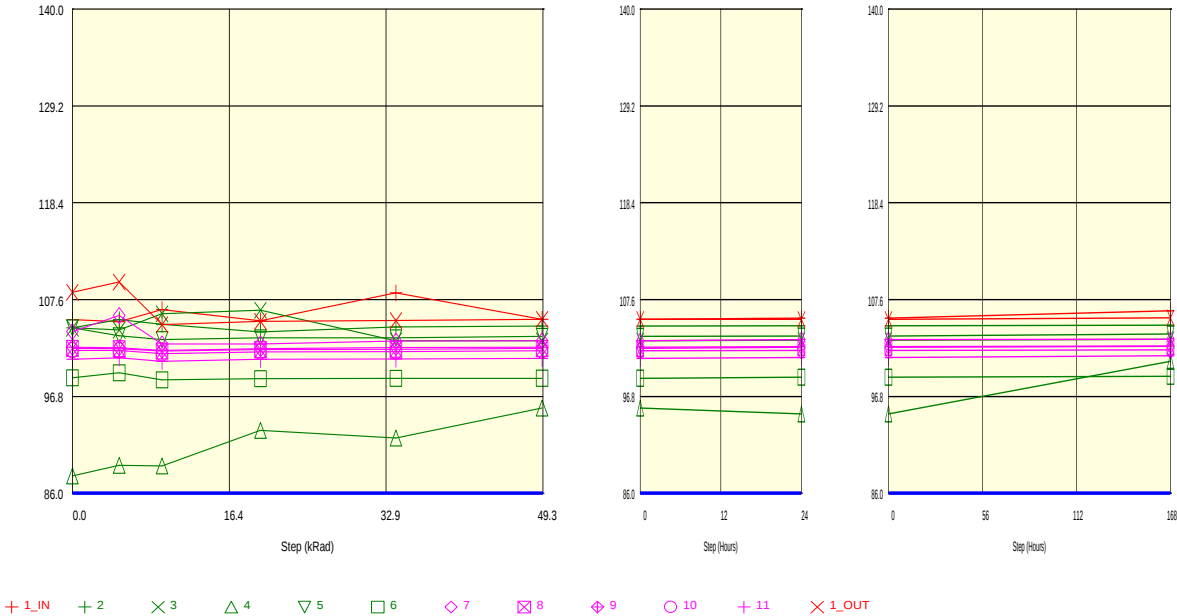
$A_{v_±12V}$	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	89.4	89.3	89.4	89.4	89.4	89.4	89.4	89.4
1_OUT_REF	89.4	89.4	89.4	89.4	89.4	89.4	89.4	89.3
ON samples								
2	89.8	89.7	89.7	89.6	89.6	89.5	89.4	89.5
3	90.4	90.3	90.4	90.3	90.3	90.2	90.2	90.3
4	90.4	90.4	90.5	90.3	90.6	90.2	90.6	90.3
5	90.1	90.1	90.1	90.1	90.0	89.9	89.9	90.0
6	89.8	89.8	89.8	89.8	89.7	89.7	89.7	89.7
Statistics								
Min	89.8	89.7	89.7	89.6	89.6	89.5	89.4	89.5
Max	90.4	90.4	90.5	90.3	90.6	90.2	90.6	90.3
Average	90.1	90.1	90.1	90.0	90.0	89.9	90.0	90.0
Std Deviation	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3

Measurements

$A_{v_±12V}$	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	89.4	89.3	89.4	89.4	89.4	89.4	89.4	89.4
1_OUT_REF	89.4	89.4	89.4	89.4	89.4	89.4	89.4	89.3
OFF samples								
7	90.0	89.9	89.9	90.0	89.8	89.8	89.8	89.8
8	89.6	89.6	89.6	89.6	89.5	89.4	89.4	89.4
9	89.6	89.5	89.5	89.5	89.4	89.4	89.3	89.4
10	89.4	89.4	89.4	89.3	89.3	89.2	89.2	89.1
11	89.3	89.2	89.3	89.2	89.1	89.1	89.1	89.1
Statistics								
Min	89.3	89.2	89.3	89.2	89.1	89.1	89.1	89.1
Max	90.0	89.9	89.9	90.0	89.8	89.8	89.8	89.8
Average	89.6	89.5	89.5	89.5	89.4	89.4	89.4	89.4
Std Deviation	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

Parameter : Common Mode Rejection Ratio : CMRR_±12V
 Test conditions : Vcm = ±10V
 Unit : dB
 Spec Limit Min : 86.0
 Spec limits are represented in bold lines on the graphic.



CMRR_±12V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	105.4	105.1	106.5	105.2	108.4	105.4	105.5	106.3
1_OUT_REF	108.4	109.6	104.8	105.2	105.3	105.4	105.4	105.6
ON samples								
2	104.4	105.4	104.8	104.0	104.6	104.6	104.7	104.8
3	104.4	104.2	106.0	106.4	103.0	103.0	103.1	103.2
4	87.9	89.1	89.0	93.0	92.2	95.5	94.8	100.7
5	104.4	103.6	103.1	103.3	103.3	103.5	103.5	103.8
6	98.9	99.5	98.7	98.8	98.8	98.8	98.9	99.0
Statistics								
Min	87.9	89.1	89.0	93.0	92.2	95.5	94.8	99.0
Max	104.4	105.4	106.0	106.4	104.6	104.6	104.7	104.8
Average	100.0	100.3	100.3	101.1	100.4	101.1	101.0	102.3
Std Deviation	6.4	6.0	6.2	4.7	4.5	3.4	3.6	2.1

CMRR_±12V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	105.4	105.1	106.5	105.2	108.4	105.4	105.5	106.3
1_OUT_REF	108.4	109.6	104.8	105.2	105.3	105.4	105.4	105.6
OFF samples								
7	104.0	105.8	102.6	102.7	103.0	103.0	103.1	103.2
8	102.2	102.1	101.9	102.0	102.0	102.2	102.3	102.4
9	102.3	102.2	101.9	102.1	102.3	102.3	102.4	102.4
10	101.9	101.9	101.6	101.8	101.8	101.9	101.9	102.0
11	101.0	101.1	100.7	101.0	101.0	101.1	101.1	101.3
Statistics								
Min	101.0	101.1	100.7	101.0	101.0	101.1	101.1	101.3
Max	104.0	105.8	102.6	102.7	103.0	103.0	103.1	103.2
Average	102.3	102.6	101.7	101.9	102.0	102.1	102.2	102.3
Std Deviation	1.0	1.6	0.6	0.6	0.6	0.6	0.7	0.6

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

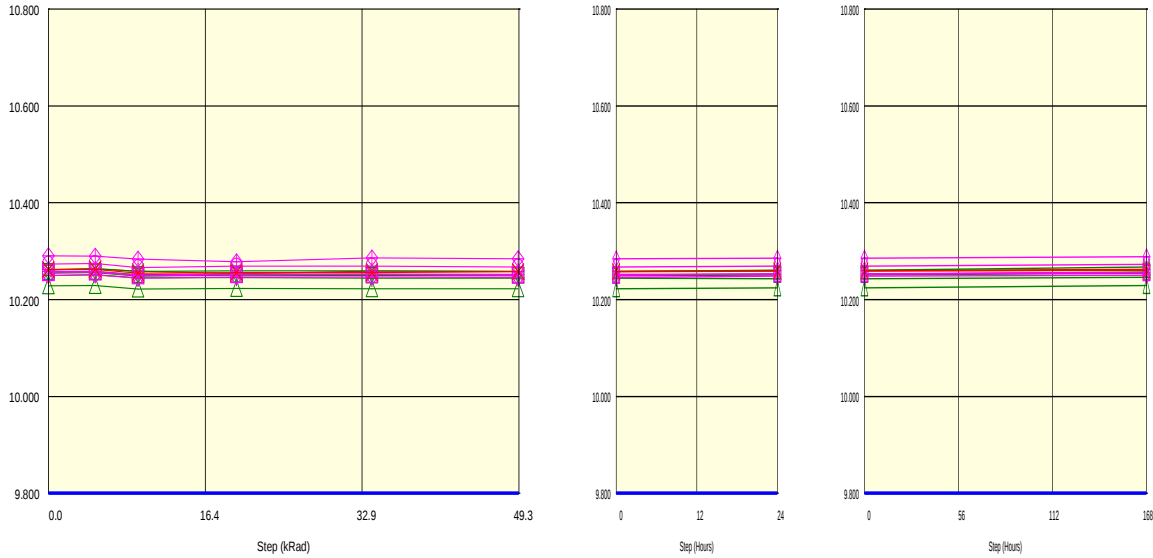
Parameter : Output Voltage Swing (plus) : Vout+ _±12V

Test conditions :

Unit : V

Spec Limit Min : 9.800

Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 × 3 △ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 10 + 11 × 1_OUT

Measurements

Vout+ _±12V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	10.262	10.263	10.259	10.253	10.259	10.258	10.260	10.262
1_OUT_REF	10.262	10.262	10.254	10.256	10.256	10.258	10.259	10.260
ON samples								
2	10.250	10.252	10.245	10.246	10.244	10.244	10.243	10.246
3	10.261	10.264	10.258	10.259	10.260	10.258	10.261	10.268
4	10.228	10.229	10.222	10.223	10.222	10.222	10.224	10.229
5	10.255	10.256	10.249	10.250	10.250	10.249	10.251	10.254
6	10.258	10.258	10.252	10.253	10.251	10.251	10.252	10.257
Statistics								
Min	10.228	10.229	10.222	10.223	10.222	10.222	10.224	10.229
Max	10.261	10.264	10.258	10.259	10.260	10.258	10.261	10.268
Average	10.250	10.252	10.245	10.246	10.245	10.245	10.246	10.251
Std Deviation	0.012	0.012	0.012	0.012	0.013	0.012	0.012	0.013

Measurements

Vout+ _±12V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	10.262	10.263	10.259	10.253	10.259	10.258	10.260	10.262
1_OUT_REF	10.262	10.262	10.254	10.256	10.256	10.258	10.259	10.260
OFF samples								
7	10.250	10.251	10.244	10.247	10.247	10.246	10.248	10.250
8	10.256	10.257	10.249	10.252	10.252	10.250	10.253	10.256
9	10.290	10.290	10.284	10.278	10.286	10.284	10.286	10.288
10	10.273	10.275	10.266	10.269	10.269	10.267	10.269	10.273
11	10.258	10.258	10.250	10.253	10.253	10.252	10.253	10.256
Statistics								
Min	10.250	10.251	10.244	10.247	10.247	10.246	10.248	10.250
Max	10.290	10.290	10.284	10.278	10.286	10.284	10.286	10.288
Average	10.266	10.266	10.259	10.260	10.261	10.260	10.262	10.265
Std Deviation	0.015	0.014	0.015	0.012	0.014	0.014	0.014	0.014

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

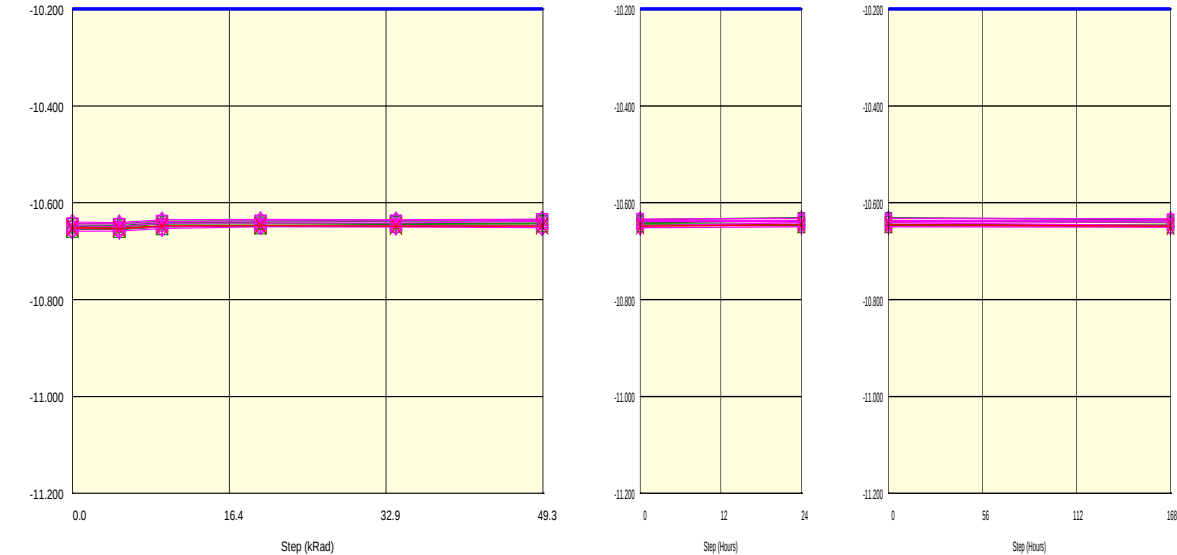
Parameter : Output Voltage Swing (minus) : Vout_±12V

Test conditions :

Unit : V

Spec Limit Max : -10.200

Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 ✕ 3 △ 4 ▽ 5 □ 6 ◇ 7 ☒ 8 ⬢ 9 ○ 10 + 11 ✕ 1_OUT

Measurements								
Vout_±12V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	-10.651	-10.652	-10.648	-10.646	-10.646	-10.646	-10.645	-10.648
1_OUT_REF	-10.652	-10.654	-10.648	-10.647	-10.648	-10.648	-10.645	-10.648
ON samples								
2	-10.648	-10.647	-10.641	-10.640	-10.638	-10.637	-10.637	-10.638
3	-10.655	-10.655	-10.649	-10.649	-10.649	-10.647	-10.646	-10.649
4	-10.643	-10.644	-10.638	-10.638	-10.636	-10.635	-10.631	-10.636
5	-10.649	-10.650	-10.644	-10.643	-10.643	-10.642	-10.637	-10.641
6	-10.655	-10.655	-10.649	-10.648	-10.645	-10.643	-10.644	-10.646
Statistics								
Min	-10.655	-10.655	-10.649	-10.649	-10.649	-10.647	-10.646	-10.649
Max	-10.643	-10.644	-10.638	-10.638	-10.636	-10.635	-10.631	-10.636
Average	-10.650	-10.650	-10.644	-10.644	-10.642	-10.641	-10.639	-10.642
Std Deviation	0.004	0.005	0.004	0.004	0.005	0.004	0.006	0.005

Measurements								
Vout_±12V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	-10.651	-10.652	-10.648	-10.646	-10.646	-10.646	-10.645	-10.648
1_OUT_REF	-10.652	-10.654	-10.648	-10.647	-10.648	-10.648	-10.645	-10.648
OFF samples								
7	-10.640	-10.641	-10.635	-10.634	-10.635	-10.634	-10.632	-10.633
8	-10.648	-10.649	-10.642	-10.642	-10.642	-10.638	-10.639	-10.640
9	-10.658	-10.659	-10.653	-10.650	-10.650	-10.651	-10.650	-10.650
10	-10.654	-10.654	-10.649	-10.647	-10.648	-10.648	-10.641	-10.647
11	-10.644	-10.644	-10.639	-10.638	-10.637	-10.636	-10.637	-10.636
Statistics								
Min	-10.658	-10.659	-10.653	-10.650	-10.650	-10.651	-10.650	-10.650
Max	-10.640	-10.641	-10.635	-10.634	-10.635	-10.634	-10.632	-10.633
Average	-10.649	-10.649	-10.644	-10.642	-10.642	-10.641	-10.640	-10.641
Std Deviation	0.007	0.006	0.007	0.006	0.006	0.007	0.006	0.007

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

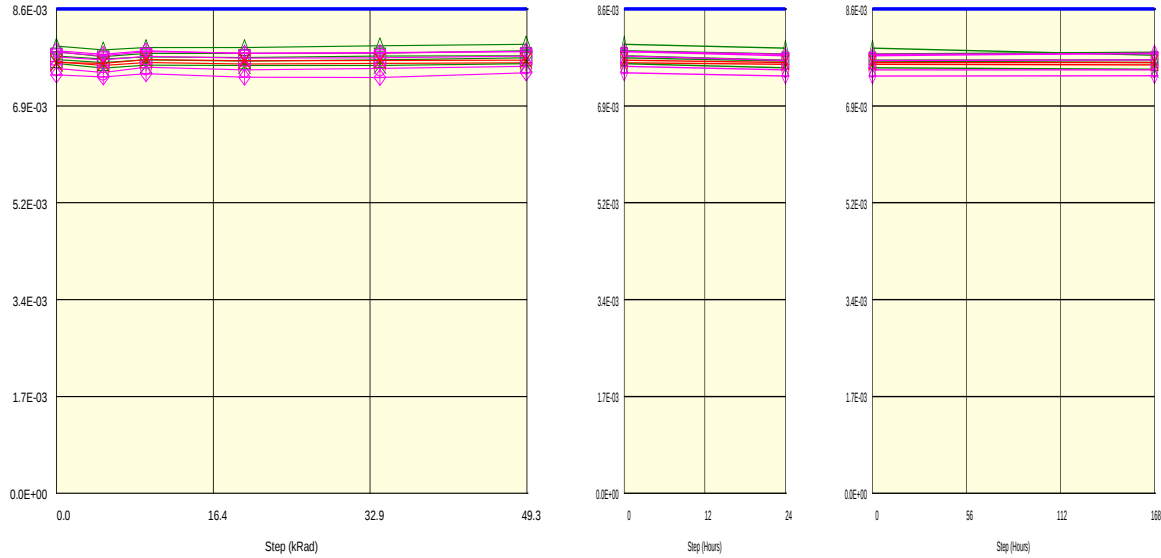
Parameter : Positive Supply Current : Is+EN_±12V

Test conditions : Output Enabled

Unit : A

Spec Limit Max : 8.6E-03

Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 × 3 △ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 × 1_OUT

Measurements

Is+EN ±12V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	7.7E-03	7.6E-03	7.7E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03
1_OUT_REF	7.7E-03	7.6E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.6E-03
ON samples								
2	7.8E-03	7.8E-03	7.8E-03	7.8E-03	7.8E-03	7.9E-03	7.8E-03	7.8E-03
3	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.5E-03
4	7.9E-03	7.9E-03	7.9E-03	7.9E-03	7.9E-03	8.0E-03	7.9E-03	7.8E-03
5	7.8E-03	7.7E-03	7.8E-03	7.7E-03	7.8E-03	7.8E-03	7.7E-03	7.7E-03
6	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.6E-03
Statistics								
Min	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.5E-03
Max	7.9E-03	7.9E-03	7.9E-03	7.9E-03	7.9E-03	8.0E-03	7.9E-03	7.8E-03
Average	7.8E-03	7.7E-03	7.8E-03	7.7E-03	7.8E-03	7.8E-03	7.7E-03	7.7E-03
Std Deviation	107.4E-06	108.3E-06	105.3E-06	109.8E-06	117.0E-06	117.4E-06	119.7E-06	105.0E-06

Measurements

Is+EN ±12V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	7.7E-03	7.6E-03	7.7E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03
1_OUT_REF	7.7E-03	7.6E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.6E-03
OFF samples								
7	7.9E-03	7.8E-03	7.9E-03	7.8E-03	7.8E-03	7.8E-03	7.8E-03	7.8E-03
8	7.8E-03	7.7E-03	7.8E-03	7.7E-03	7.7E-03	7.8E-03	7.7E-03	7.7E-03
9	7.4E-03	7.4E-03	7.5E-03	7.4E-03	7.4E-03	7.5E-03	7.4E-03	7.4E-03
10	7.5E-03	7.5E-03	7.6E-03	7.5E-03	7.6E-03	7.6E-03	7.5E-03	7.5E-03
11	7.8E-03	7.8E-03	7.8E-03	7.8E-03	7.8E-03	7.8E-03	7.8E-03	7.8E-03
Statistics								
Min	7.4E-03	7.4E-03	7.5E-03	7.4E-03	7.4E-03	7.5E-03	7.4E-03	7.4E-03
Max	7.9E-03	7.8E-03	7.9E-03	7.8E-03	7.8E-03	7.8E-03	7.8E-03	7.8E-03
Average	7.7E-03	7.6E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.6E-03	7.7E-03
Std Deviation	166.6E-06	163.3E-06	159.9E-06	170.4E-06	170.7E-06	151.5E-06	148.9E-06	158.8E-06

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

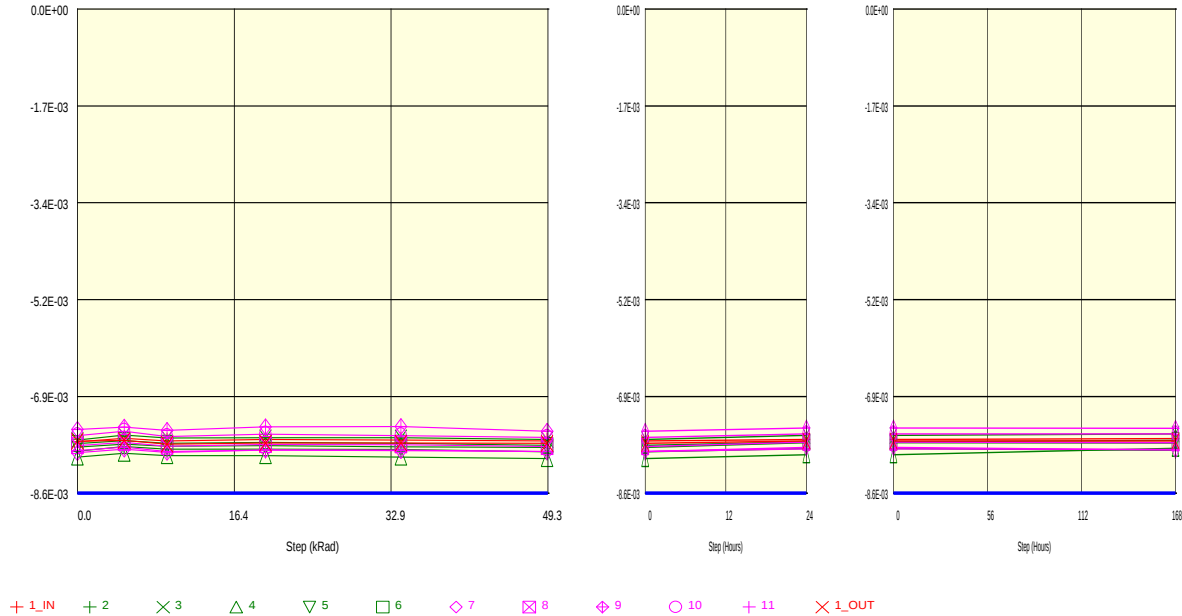
Parameter : Positive Supply Current : Is-EN_±12V

Test conditions : Output Enabled

Unit : A

Spec Limit Min : -8.6E-03

Spec limits are represented in bold lines on the graphic.



Measurements

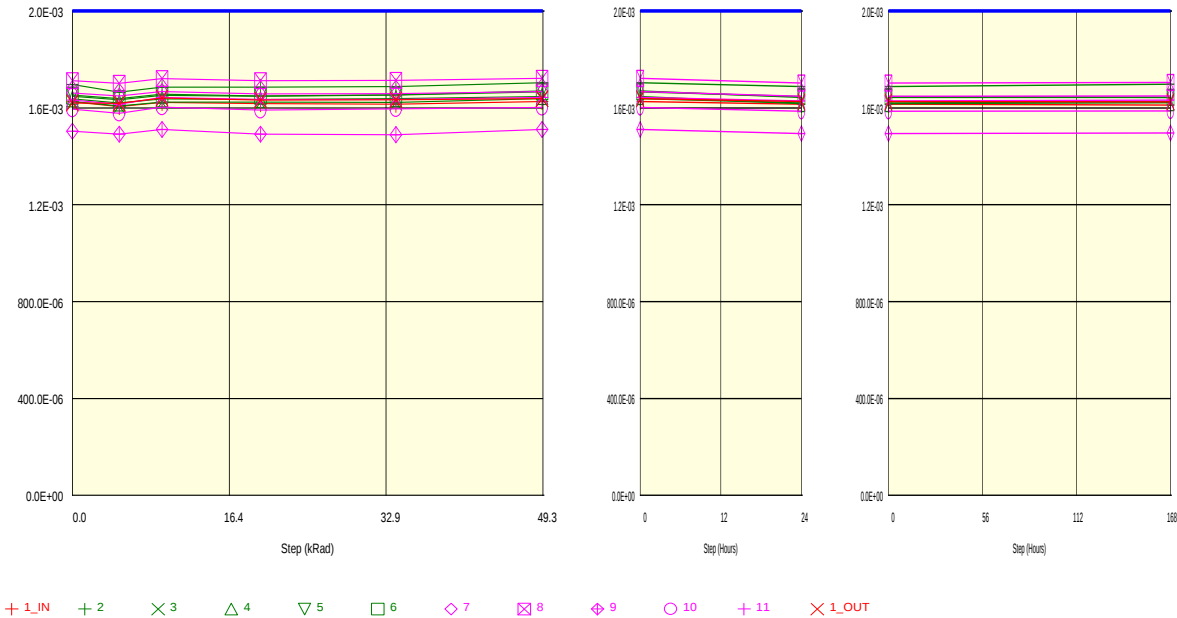
Is-EN_±12V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	-7.7E-03	-7.6E-03	-7.7E-03	-7.6E-03	-7.7E-03	-7.7E-03	-7.6E-03	-7.6E-03
1_OUT_REF	-7.7E-03	-7.7E-03	-7.7E-03	-7.7E-03	-7.7E-03	-7.7E-03	-7.7E-03	-7.7E-03
ON samples								
2	-7.9E-03	-7.8E-03	-7.8E-03	-7.8E-03	-7.8E-03	-7.9E-03	-7.8E-03	-7.8E-03
3	-7.7E-03	-7.6E-03	-7.6E-03	-7.6E-03	-7.6E-03	-7.6E-03	-7.6E-03	-7.5E-03
4	-8.0E-03	-7.9E-03	-7.9E-03	-7.9E-03	-8.0E-03	-8.0E-03	-7.9E-03	-7.8E-03
5	-7.8E-03	-7.7E-03	-7.8E-03	-7.8E-03	-7.8E-03	-7.8E-03	-7.7E-03	-7.7E-03
6	-7.7E-03	-7.7E-03	-7.7E-03	-7.7E-03	-7.7E-03	-7.7E-03	-7.7E-03	-7.7E-03
Statistics								
Min	-8.0E-03	-7.9E-03	-7.9E-03	-7.9E-03	-8.0E-03	-8.0E-03	-7.9E-03	-7.8E-03
Max	-7.7E-03	-7.6E-03	-7.6E-03	-7.6E-03	-7.6E-03	-7.6E-03	-7.6E-03	-7.5E-03
Average	-7.8E-03	-7.7E-03	-7.8E-03	-7.8E-03	-7.8E-03	-7.8E-03	-7.7E-03	-7.7E-03
Std Deviation	105.7E-06	106.9E-06	103.9E-06	107.7E-06	115.4E-06	114.7E-06	117.6E-06	103.9E-06

Measurements

Is-EN_±12V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	-7.7E-03	-7.6E-03	-7.7E-03	-7.6E-03	-7.7E-03	-7.7E-03	-7.6E-03	-7.6E-03
1_OUT_REF	-7.7E-03	-7.7E-03	-7.7E-03	-7.7E-03	-7.7E-03	-7.7E-03	-7.7E-03	-7.7E-03
OFF samples								
7	-7.9E-03	-7.8E-03	-7.9E-03	-7.8E-03	-7.8E-03	-7.9E-03	-7.8E-03	-7.8E-03
8	-7.8E-03	-7.7E-03	-7.8E-03	-7.7E-03	-7.7E-03	-7.8E-03	-7.7E-03	-7.7E-03
9	-7.5E-03	-7.4E-03	-7.5E-03	-7.4E-03	-7.4E-03	-7.5E-03	-7.4E-03	-7.4E-03
10	-7.6E-03	-7.5E-03	-7.6E-03	-7.5E-03	-7.6E-03	-7.6E-03	-7.5E-03	-7.5E-03
11	-7.8E-03	-7.8E-03	-7.9E-03	-7.8E-03	-7.8E-03	-7.9E-03	-7.8E-03	-7.8E-03
Statistics								
Min	-7.9E-03	-7.8E-03	-7.9E-03	-7.8E-03	-7.8E-03	-7.9E-03	-7.8E-03	-7.8E-03
Max	-7.5E-03	-7.4E-03	-7.5E-03	-7.4E-03	-7.4E-03	-7.5E-03	-7.4E-03	-7.4E-03
Average	-7.7E-03	-7.6E-03	-7.7E-03	-7.7E-03	-7.7E-03	-7.7E-03	-7.7E-03	-7.7E-03
Std Deviation	158.4E-06	155.3E-06	153.0E-06	163.1E-06	163.6E-06	144.7E-06	142.3E-06	151.7E-06

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

Parameter : Positive Supply Current : Is+DIS_±12V
 Test conditions : Output Disabled
 Unit : A
 Spec Limit Max : 2.0E-03
 Spec limits are represented in bold lines on the graphic.



Measurements

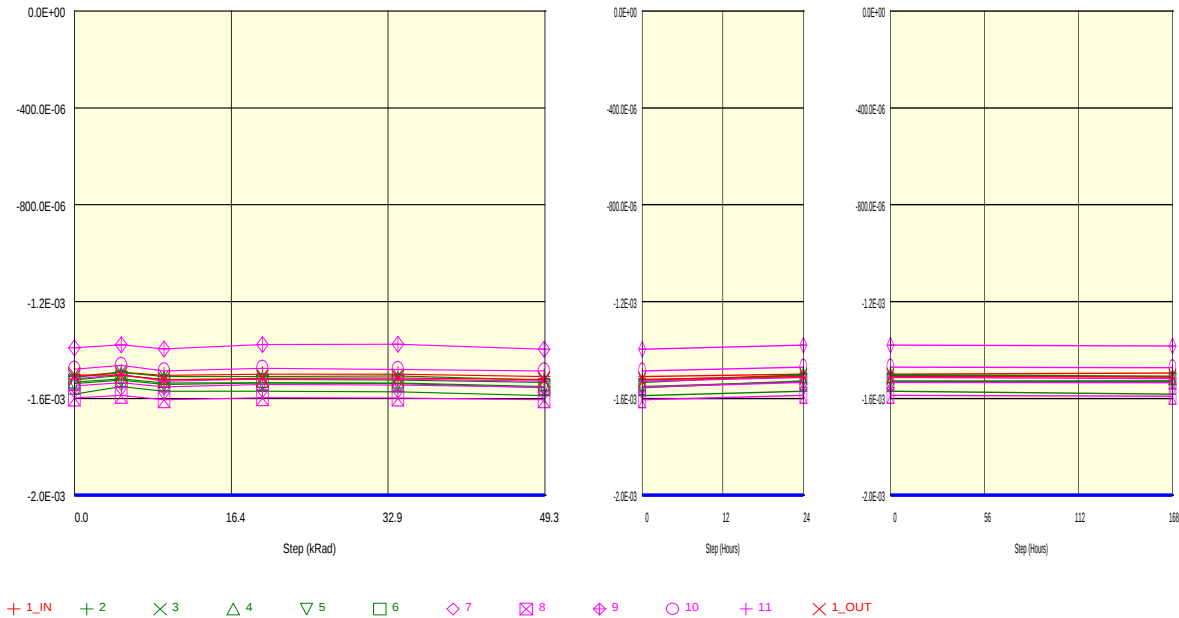
Is+DIS_±12V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03
1_OUT_REF	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03
ON samples								
2	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03
3	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03
4	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03
5	1.7E-03	1.6E-03	1.7E-03	1.6E-03	1.7E-03	1.7E-03	1.6E-03	1.6E-03
6	1.6E-03	1.6E-03	1.7E-03	1.6E-03	1.7E-03	1.7E-03	1.6E-03	1.6E-03
Statistics								
Min	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03
Max	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03
Average	1.7E-03	1.6E-03	1.7E-03	1.6E-03	1.7E-03	1.7E-03	1.6E-03	1.6E-03
Std Deviation	23.8E-06	19.6E-06	20.9E-06	21.0E-06	21.8E-06	22.9E-06	25.5E-06	26.8E-06

Measurements

Is+DIS_±12V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03
1_OUT_REF	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03
OFF samples								
7	1.7E-03	1.6E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.6E-03	1.6E-03
8	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03
9	1.5E-03	1.5E-03	1.5E-03	1.5E-03	1.5E-03	1.5E-03	1.5E-03	1.5E-03
10	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03
11	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03
Statistics								
Min	1.5E-03	1.5E-03	1.5E-03	1.5E-03	1.5E-03	1.5E-03	1.5E-03	1.5E-03
Max	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03
Average	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03
Std Deviation	70.1E-06	70.7E-06	70.5E-06	74.4E-06	75.1E-06	70.8E-06	69.9E-06	69.9E-06

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

Parameter : Negative Supply Current : Is-DIS_±12V
 Test conditions : Output Disabled
 Unit : A
 Spec Limit Min : -2.0E-03
 Spec limits are represented in bold lines on the graphic.



Measurements

Is-DIS_±12V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03
1_OUT_REF	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03
ON samples								
2	-1.6E-03	-1.6E-03	-1.6E-03	-1.6E-03	-1.6E-03	-1.6E-03	-1.6E-03	-1.6E-03
3	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03
4	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03
5	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.6E-03	-1.5E-03	-1.5E-03
6	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.6E-03	-1.5E-03	-1.5E-03
Statistics								
Min	-1.6E-03	-1.6E-03	-1.6E-03	-1.6E-03	-1.6E-03	-1.6E-03	-1.6E-03	-1.6E-03
Max	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03
Average	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.6E-03	-1.5E-03	-1.5E-03
Std Deviation	23.7E-06	19.8E-06	20.4E-06	20.5E-06	21.6E-06	21.9E-06	24.7E-06	26.5E-06

Measurements

Is-DIS_±12V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03
1_OUT_REF	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03
OFF samples								
7	-1.5E-03	-1.5E-03	-1.6E-03	-1.5E-03	-1.5E-03	-1.6E-03	-1.5E-03	-1.5E-03
8	-1.6E-03	-1.6E-03	-1.6E-03	-1.6E-03	-1.6E-03	-1.6E-03	-1.6E-03	-1.6E-03
9	-1.4E-03	-1.4E-03	-1.4E-03	-1.4E-03	-1.4E-03	-1.4E-03	-1.4E-03	-1.4E-03
10	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03
11	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03
Statistics								
Min	-1.6E-03	-1.6E-03	-1.6E-03	-1.6E-03	-1.6E-03	-1.6E-03	-1.6E-03	-1.6E-03
Max	-1.4E-03	-1.4E-03	-1.4E-03	-1.4E-03	-1.4E-03	-1.4E-03	-1.4E-03	-1.4E-03
Average	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03	-1.5E-03
Std Deviation	70.0E-06	70.4E-06	70.5E-06	74.0E-06	74.6E-06	70.1E-06	69.6E-06	69.4E-06

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

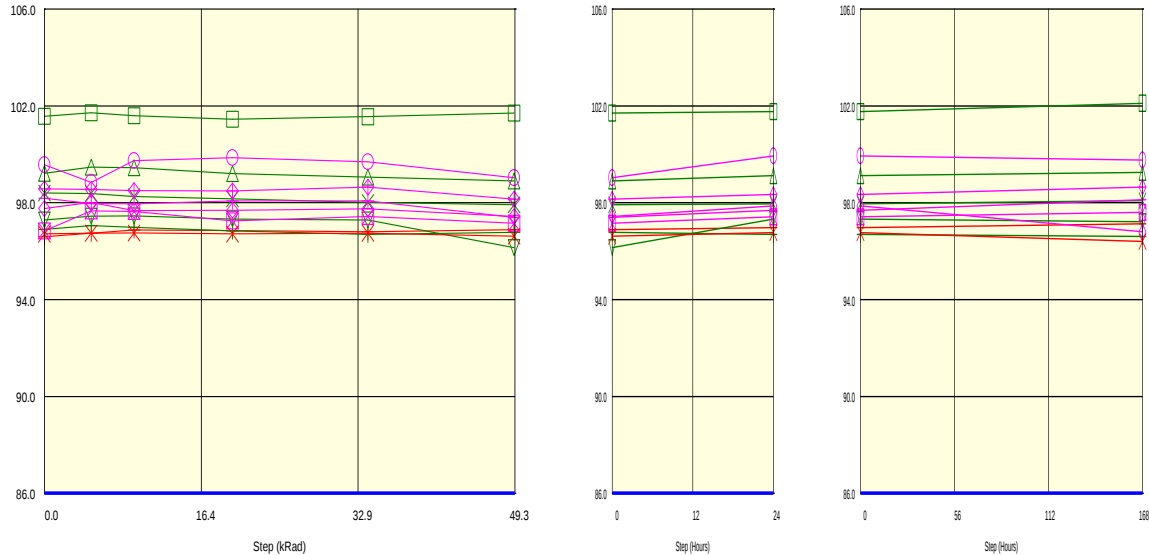
Parameter : Power Supply Rejection Ratio (plus) : PSRR+ $\pm 12V$

Test conditions : Vcc = +11V to +13V. Vee = -12V

Unit : dB

Spec Limit Min : 86.0

Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 x 3 triangle 4 inverted triangle 5 square 6 diamond 7 square 8 circle 9 circle 10 + 11 x 1_OUT

Measurements

PSRR+ $\pm 12V$	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	96.6	96.7	96.9	96.9	96.8	96.9	97.0	97.1
1_OUT_REF	96.7	96.7	96.8	96.7	96.7	96.6	96.8	96.4
ON samples								
2	96.9	97.1	97.0	96.8	96.7	96.8	96.7	96.6
3	98.4	98.4	98.3	98.2	98.0	97.9	98.0	98.1
4	99.2	99.5	99.4	99.2	99.1	98.9	99.1	99.3
5	97.3	97.4	97.5	97.3	97.3	96.1	97.3	97.2
6	101.6	101.7	101.6	101.5	101.6	101.7	101.8	102.1
Statistics								
Min	96.9	97.1	97.0	96.8	96.7	96.1	96.7	96.6
Max	101.6	101.7	101.6	101.5	101.6	101.7	101.8	102.1
Average	98.7	98.8	98.7	98.6	98.5	98.3	98.6	98.7
Std Deviation	1.7	1.7	1.6	1.6	1.7	2.0	1.8	1.9

Measurements

PSRR+ $\pm 12V$	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	96.6	96.7	96.9	96.9	96.8	96.9	97.0	97.1
1_OUT_REF	96.7	96.7	96.8	96.7	96.7	96.6	96.8	96.4
OFF samples								
7	97.8	98.0	97.7	97.7	97.7	97.4	97.9	96.8
8	96.8	97.7	97.6	97.3	97.4	97.2	97.4	97.6
9	98.6	98.5	98.5	98.5	98.7	98.1	98.3	98.7
10	99.6	98.8	99.7	99.9	99.7	99.0	99.9	99.8
11	98.2	98.0	98.0	98.1	98.1	97.4	97.7	98.1
Statistics								
Min	96.8	97.7	97.6	97.3	97.4	97.2	97.4	96.8
Max	99.6	98.8	99.7	99.9	99.7	99.0	99.9	99.8
Average	98.2	98.2	98.3	98.3	98.3	97.8	98.3	98.2
Std Deviation	0.9	0.4	0.8	0.9	0.8	0.7	0.9	1.0

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

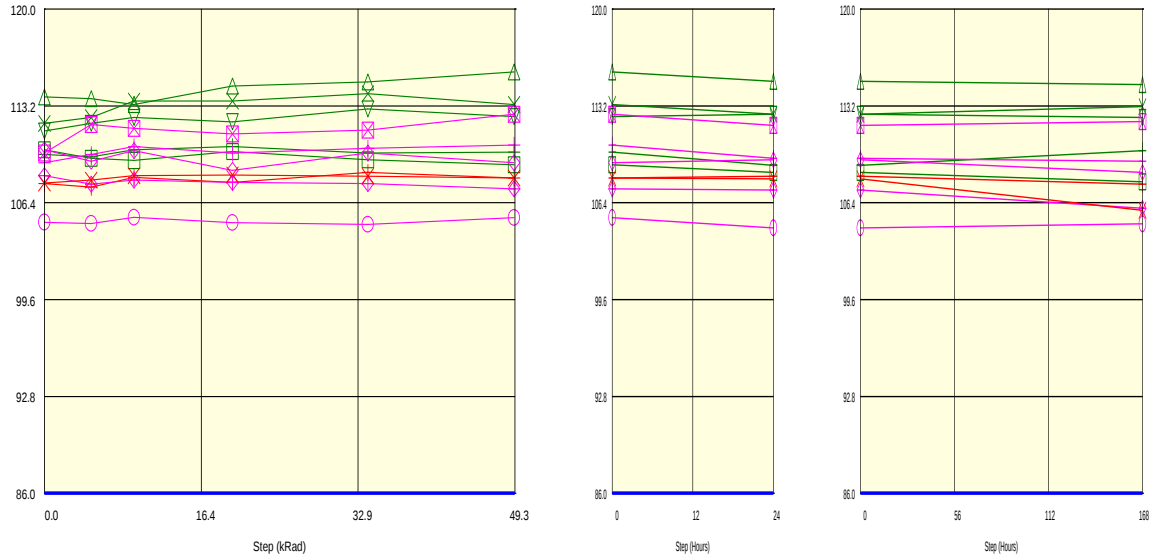
Parameter : Power Supply Rejection Ratio (minus) : PSRR- $\pm 12V$

Test conditions : Vcc = 12V. Vee = -11V to -13V

Unit : dB

Spec Limit Min : 86.0

Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 × 3 △ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 × 1_OUT

Measurements

PSRR- $\pm 12V$	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	107.7	107.5	108.2	107.8	108.5	108.1	108.3	107.7
1_OUT_REF	107.8	108.0	108.3	108.4	108.3	108.1	108.1	105.9
ON samples								
2	109.8	109.6	110.1	110.3	109.9	110.0	109.0	110.1
3	112.0	112.4	113.6	113.6	114.1	113.3	112.6	113.2
4	113.8	113.7	113.3	114.6	114.9	115.6	114.9	114.7
5	111.4	112.0	112.4	112.1	113.0	112.5	112.6	112.4
6	110.1	109.5	109.4	110.0	109.4	109.1	108.5	107.9
Statistics								
Min	109.8	109.5	109.4	110.0	109.4	109.1	108.5	107.9
Max	113.8	113.7	113.6	114.6	114.9	115.6	114.9	114.7
Average	111.4	111.4	111.7	112.1	112.3	112.1	111.5	111.6
Std Deviation	1.4	1.6	1.7	1.8	2.2	2.4	2.4	2.4

Measurements

PSRR- $\pm 12V$	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	107.7	107.5	108.2	107.8	108.5	108.1	108.3	107.7
1_OUT_REF	107.8	108.0	108.3	108.4	108.3	108.1	108.1	105.9
OFF samples								
7	110.1	109.3	110.1	108.7	109.9	109.2	109.4	108.5
8	109.9	111.9	111.6	111.2	111.5	112.6	111.8	112.1
9	108.3	107.7	108.0	107.8	107.7	107.4	107.3	106.0
10	105.0	104.9	105.4	105.0	104.9	105.4	104.6	104.9
11	109.2	109.8	110.3	109.9	110.2	110.5	109.5	109.3
Statistics								
Min	105.0	104.9	105.4	105.0	104.9	105.4	104.6	104.9
Max	110.1	111.9	111.6	111.2	111.5	112.6	111.8	112.1
Average	108.5	108.7	109.1	108.5	108.9	109.0	108.5	108.2
Std Deviation	1.9	2.3	2.2	2.1	2.3	2.5	2.4	2.5

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

Parameter : Input Offset Voltage : Vos_5V

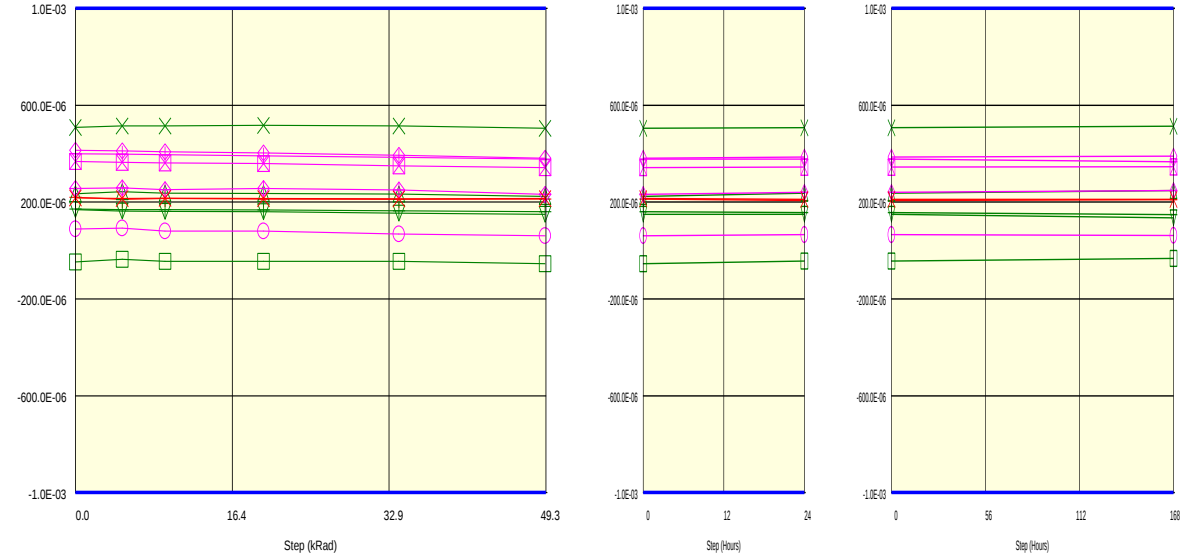
Test conditions :

Unit : V

Spec Limit Min : -1.0E-03

Spec Limit Max : 1.0E-03

Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 X 1_OUT

Measurements

Vos_5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	219.6E-06	211.6E-06	215.2E-06	213.2E-06	211.6E-06	212.8E-06	206.4E-06	210.0E-06
1_OUT_REF	217.6E-06	214.8E-06	216.4E-06	215.2E-06	214.0E-06	215.2E-06	211.2E-06	211.2E-06
ON samples								
2	171.2E-06	168.4E-06	169.2E-06	168.0E-06	164.4E-06	160.0E-06	157.2E-06	148.8E-06
3	508.4E-06	515.2E-06	514.4E-06	517.2E-06	514.8E-06	505.2E-06	508.0E-06	514.0E-06
4	234.0E-06	243.2E-06	236.8E-06	236.0E-06	233.2E-06	224.0E-06	236.8E-06	248.4E-06
5	169.2E-06	162.8E-06	161.6E-06	160.0E-06	154.4E-06	149.6E-06	150.0E-06	134.8E-06
6	-47.2E-06	-36.0E-06	-45.2E-06	-44.4E-06	-45.2E-06	-54.0E-06	-43.2E-06	-32.0E-06
Statistics								
Min	-47.2E-06	-36.0E-06	-45.2E-06	-44.4E-06	-45.2E-06	-54.0E-06	-43.2E-06	-32.0E-06
Max	508.4E-06	515.2E-06	514.4E-06	517.2E-06	514.8E-06	505.2E-06	508.0E-06	514.0E-06
Average	207.1E-06	210.7E-06	207.4E-06	207.4E-06	204.3E-06	197.0E-06	201.8E-06	202.8E-06
Std Deviation	178.3E-06	178.2E-06	180.3E-06	181.1E-06	180.9E-06	180.2E-06	178.7E-06	179.8E-06

Measurements

Vos_5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	219.6E-06	211.6E-06	215.2E-06	213.2E-06	211.6E-06	212.8E-06	206.4E-06	210.0E-06
1_OUT_REF	217.6E-06	214.8E-06	216.4E-06	215.2E-06	214.0E-06	215.2E-06	211.2E-06	211.2E-06
OFF samples								
7	414.0E-06	411.2E-06	407.6E-06	402.8E-06	393.2E-06	381.6E-06	386.4E-06	390.0E-06
8	367.6E-06	364.0E-06	362.4E-06	360.0E-06	350.4E-06	342.0E-06	344.4E-06	345.6E-06
9	256.4E-06	258.4E-06	252.0E-06	256.4E-06	250.8E-06	232.0E-06	240.4E-06	247.6E-06
10	88.8E-06	92.8E-06	80.0E-06	80.0E-06	68.0E-06	60.4E-06	65.2E-06	62.4E-06
11	399.2E-06	398.4E-06	396.0E-06	391.6E-06	384.8E-06	378.0E-06	378.0E-06	367.2E-06
Statistics								
Min	88.8E-06	92.8E-06	80.0E-06	80.0E-06	68.0E-06	60.4E-06	65.2E-06	62.4E-06
Max	414.0E-06	411.2E-06	407.6E-06	402.8E-06	393.2E-06	381.6E-06	386.4E-06	390.0E-06
Average	305.2E-06	305.0E-06	299.6E-06	298.2E-06	289.4E-06	278.8E-06	282.9E-06	282.6E-06
Std Deviation	121.5E-06	118.9E-06	122.8E-06	120.7E-06	121.7E-06	121.9E-06	120.6E-06	120.3E-06

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

Parameter : Input Offset Voltage : **ios_5V**

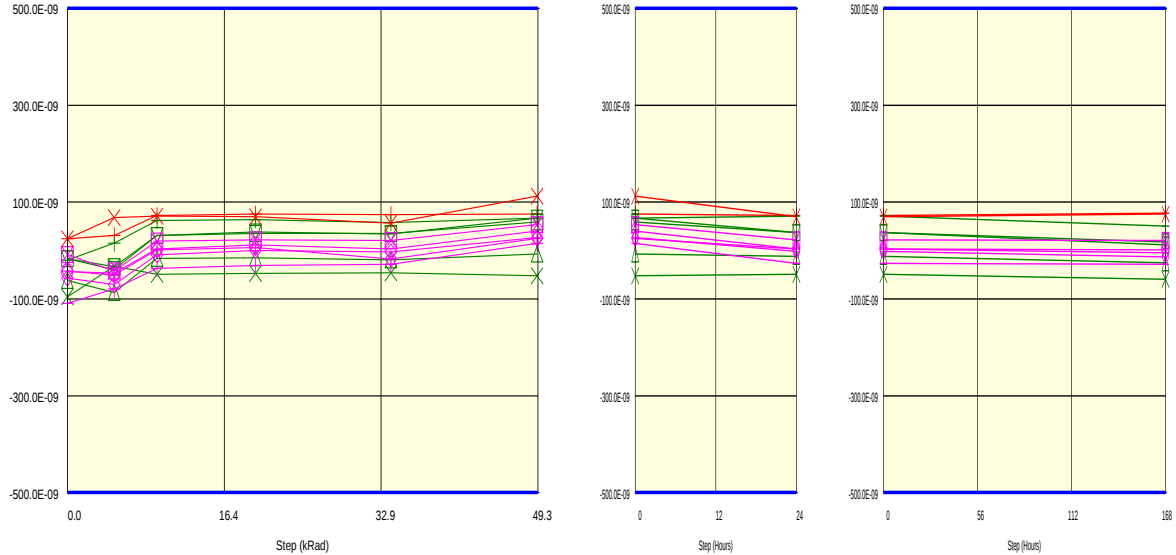
Test conditions :

Unit : A

Spec Limit Min : -500.0E-09

Spec Limit Max : 500.0E-09

Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 X 1_OUT

Measurements

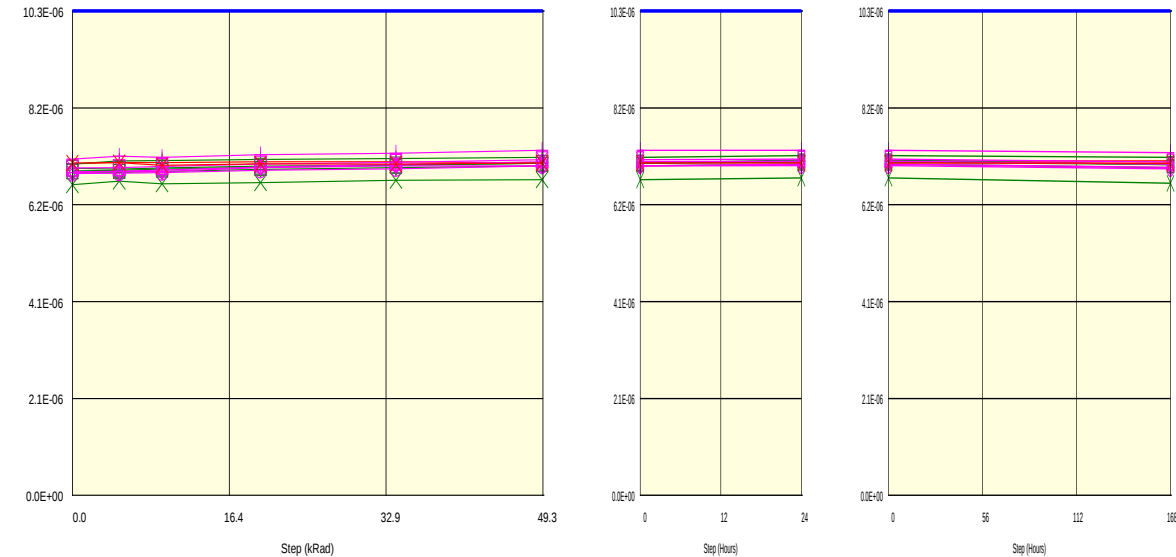
ios_5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	24.4E-09	31.1E-09	72.6E-09	75.6E-09	74.1E-09	75.6E-09	72.6E-09	77.0E-09
1_OUT_REF	24.4E-09	68.1E-09	71.1E-09	69.6E-09	56.3E-09	112.6E-09	69.6E-09	75.6E-09
ON samples								
2	-20.0E-09	15.6E-09	62.2E-09	63.7E-09	57.8E-09	66.7E-09	71.1E-09	50.4E-09
3	-95.6E-09	-32.6E-09	-48.9E-09	-47.4E-09	-45.9E-09	-51.9E-09	-48.9E-09	-59.3E-09
4	-61.5E-09	-86.7E-09	-16.3E-09	-14.8E-09	-19.3E-09	-7.4E-09	-11.9E-09	-25.2E-09
5	-17.0E-09	-39.3E-09	31.1E-09	38.5E-09	34.1E-09	66.7E-09	37.0E-09	17.8E-09
6	-17.0E-09	-33.3E-09	31.1E-09	35.6E-09	35.6E-09	59.3E-09	37.0E-09	11.9E-09
Statistics								
Min	-95.6E-09	-86.7E-09	-48.9E-09	-47.4E-09	-45.9E-09	-51.9E-09	-48.9E-09	-59.3E-09
Max	-17.0E-09	15.6E-09	62.2E-09	63.7E-09	57.8E-09	66.7E-09	71.1E-09	50.4E-09
Average	-42.2E-09	-35.3E-09	11.9E-09	15.1E-09	12.4E-09	26.7E-09	16.9E-09	-889.2E-12
Std Deviation	31.6E-09	32.4E-09	39.4E-09	40.3E-09	38.7E-09	48.1E-09	42.2E-09	37.8E-09

Measurements

ios_5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	24.4E-09	31.1E-09	72.6E-09	75.6E-09	74.1E-09	75.6E-09	72.6E-09	77.0E-09
1_OUT_REF	24.4E-09	68.1E-09	71.1E-09	69.6E-09	56.3E-09	112.6E-09	69.6E-09	75.6E-09
OFF samples								
7	-57.0E-09	-70.4E-09	-8.9E-09	0.0E+00	-3.0E-09	26.7E-09	-1.5E-09	-13.3E-09
8	-8.1E-09	-42.2E-09	19.3E-09	22.2E-09	20.7E-09	53.3E-09	22.2E-09	20.7E-09
9	-42.2E-09	-51.1E-09	1.5E-09	5.9E-09	-17.8E-09	25.2E-09	3.0E-09	-4.4E-09
10	-43.7E-09	-46.7E-09	3.0E-09	11.9E-09	3.0E-09	40.0E-09	3.0E-09	1.5E-09
11	-108.9E-09	-79.3E-09	-37.0E-09	-31.1E-09	-28.1E-09	14.8E-09	-26.7E-09	-28.1E-09
Statistics								
Min	-108.9E-09	-79.3E-09	-37.0E-09	-31.1E-09	-28.1E-09	14.8E-09	-26.7E-09	-28.1E-09
Max	-8.1E-09	-42.2E-09	19.3E-09	22.2E-09	20.7E-09	53.3E-09	22.2E-09	20.7E-09
Average	-52.0E-09	-57.9E-09	-4.4E-09	1.8E-09	-5.0E-09	32.0E-09	-176.6E-15	-4.7E-09
Std Deviation	32.7E-09	14.4E-09	18.6E-09	18.0E-09	16.9E-09	13.3E-09	15.7E-09	16.2E-09

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

Parameter : Input Bias Current (plus) : lib+_5V
 Test conditions :
 Unit : A
 Spec Limit Max : 10.3E-06
 Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 x 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 x 1_OUT

Measurements								
lib+ 5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1 IN_REF	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06
1 OUT_REF	7.1E-06	7.1E-06	7.0E-06	7.0E-06	7.0E-06	7.1E-06	7.1E-06	7.1E-06
ON samples								
2	7.0E-06	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06
3	6.6E-06	6.7E-06	6.6E-06	6.6E-06	6.7E-06	6.7E-06	6.7E-06	6.6E-06
4	6.9E-06	6.9E-06	6.9E-06	7.0E-06	7.0E-06	7.1E-06	7.1E-06	7.0E-06
5	6.9E-06	6.9E-06	6.9E-06	6.9E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06
6	7.0E-06	6.9E-06	7.0E-06	7.0E-06	7.0E-06	7.1E-06	7.1E-06	7.0E-06
Statistics								
Min	6.6E-06	6.7E-06	6.6E-06	6.6E-06	6.7E-06	6.7E-06	6.7E-06	6.6E-06
Max	7.0E-06	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06
Average	6.9E-06	6.9E-06	6.9E-06	6.9E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06
Std Deviation	148.4E-09	138.5E-09	160.7E-09	161.9E-09	152.7E-09	157.8E-09	161.7E-09	181.5E-09

Measurements								
lib+ 5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1 IN_REF	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06
1 OUT_REF	7.1E-06	7.1E-06	7.0E-06	7.0E-06	7.0E-06	7.1E-06	7.1E-06	7.1E-06
OFF samples								
7	6.9E-06	6.9E-06	6.9E-06	7.0E-06	7.0E-06	7.1E-06	7.1E-06	7.0E-06
8	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.1E-06	7.1E-06	7.2E-06	7.1E-06
9	6.9E-06	6.9E-06	6.9E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06
10	6.8E-06	6.8E-06	6.9E-06	6.9E-06	6.9E-06	7.0E-06	7.0E-06	6.9E-06
11	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.3E-06	7.3E-06	7.3E-06	7.3E-06
Statistics								
Min	6.8E-06	6.8E-06	6.9E-06	6.9E-06	6.9E-06	7.0E-06	7.0E-06	6.9E-06
Max	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.3E-06	7.3E-06	7.3E-06	7.3E-06
Average	6.9E-06	7.0E-06	7.0E-06	7.0E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06
Std Deviation	112.3E-09	130.6E-09	117.1E-09	114.9E-09	112.7E-09	120.0E-09	114.9E-09	121.2E-09

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

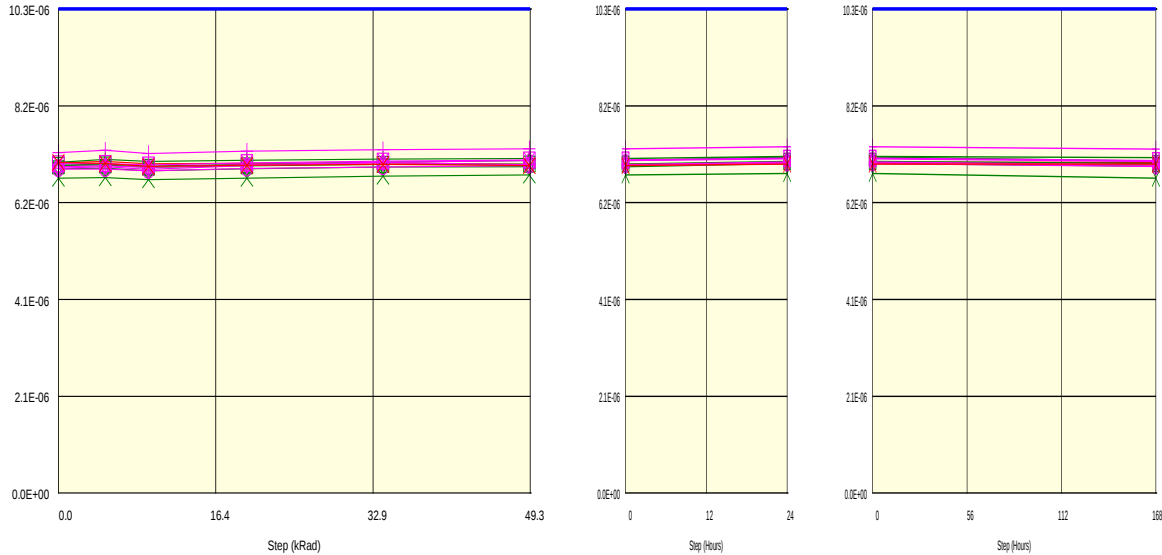
Parameter : Input Bias Current (minus) : lib_5V

Test conditions :

Unit : A

Spec Limit Max : 10.3E-06

Spec limits are represented in bold lines on the graphic.



Measurements

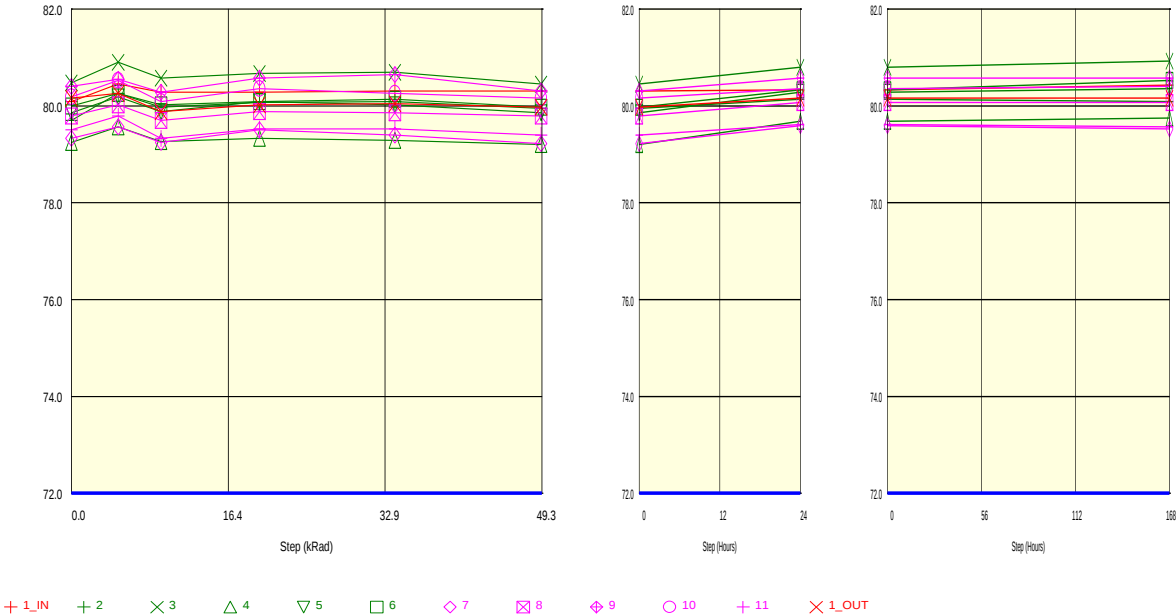
lib_ 5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1 IN_REF	7.0E-06	7.1E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06
1 OUT_REF	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06
ON samples								
2	7.0E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.1E-06
3	6.7E-06	6.7E-06	6.7E-06	6.7E-06	6.7E-06	6.8E-06	6.8E-06	6.7E-06
4	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.1E-06	7.1E-06	7.1E-06
5	6.9E-06	6.9E-06	6.9E-06	6.9E-06	6.9E-06	6.9E-06	7.0E-06	7.0E-06
6	7.0E-06	7.0E-06	6.9E-06	7.0E-06	7.0E-06	7.0E-06	7.1E-06	7.0E-06
Statistics								
Min	6.7E-06	6.7E-06	6.7E-06	6.7E-06	6.7E-06	6.8E-06	6.8E-06	6.7E-06
Max	7.0E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.1E-06
Average	6.9E-06	6.9E-06	6.9E-06	6.9E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06
Std Deviation	117.2E-09	128.4E-09	128.8E-09	127.1E-09	124.0E-09	122.8E-09	129.8E-09	149.7E-09

Measurements

lib_ 5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1 IN_REF	7.0E-06	7.1E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06
1 OUT_REF	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06
OFF samples								
7	6.9E-06	7.0E-06	6.9E-06	7.0E-06	7.0E-06	7.1E-06	7.1E-06	7.1E-06
8	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06
9	6.9E-06	6.9E-06	6.9E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.0E-06
10	6.9E-06	6.9E-06	6.9E-06	6.9E-06	6.9E-06	7.0E-06	7.0E-06	6.9E-06
11	7.2E-06	7.3E-06	7.2E-06	7.3E-06	7.3E-06	7.3E-06	7.4E-06	7.3E-06
Statistics								
Min	6.9E-06	6.9E-06	6.9E-06	6.9E-06	6.9E-06	7.0E-06	7.0E-06	6.9E-06
Max	7.2E-06	7.3E-06	7.2E-06	7.3E-06	7.3E-06	7.3E-06	7.4E-06	7.3E-06
Average	7.0E-06	7.0E-06	7.0E-06	7.0E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06
Std Deviation	128.7E-09	141.1E-09	131.7E-09	128.6E-09	123.6E-09	126.4E-09	125.3E-09	129.9E-09

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

Parameter : Open Loop Voltage Gain : Av_5V
Test conditions :
Unit : dB
Spec Limit Min : 72.0
Spec limits are represented in bold lines on the graphic.



Av_5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	80.1	80.5	80.3	80.3	80.3	80.3	80.3	80.4
1_OUT_REF	80.2	80.3	79.9	80.0	80.0	80.0	80.2	80.2
ON samples								
2	79.7	80.3	80.0	80.1	80.1	80.0	80.1	80.1
3	80.5	80.9	80.6	80.7	80.7	80.5	80.8	80.9
4	79.2	79.6	79.3	79.3	79.3	79.2	79.7	79.7
5	79.9	80.2	79.9	80.1	80.0	79.9	80.3	80.4
6	80.0	80.3	80.0	80.1	80.1	80.0	80.3	80.5
Statistics								
Min	79.2	79.6	79.3	79.3	79.3	79.2	79.7	79.7
Max	80.5	80.9	80.6	80.7	80.7	80.5	80.8	80.9
Average	79.9	80.2	79.9	80.1	80.0	79.9	80.2	80.3
Std Deviation	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4

Av_5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	80.1	80.5	80.3	80.3	80.3	80.3	80.3	80.4
1_OUT_REF	80.2	80.3	79.9	80.0	80.0	80.0	80.2	80.2
OFF samples								
7	79.3	79.6	79.2	79.5	79.4	79.2	79.6	79.5
8	79.8	80.0	79.7	79.9	79.9	79.8	80.1	80.1
9	80.4	80.5	80.3	80.6	80.6	80.3	80.6	80.6
10	80.2	80.5	80.1	80.4	80.3	80.2	80.4	80.4
11	79.5	79.8	79.3	79.5	79.5	79.4	79.6	79.6
Statistics								
Min	79.3	79.6	79.2	79.5	79.4	79.2	79.6	79.5
Max	80.4	80.5	80.3	80.6	80.6	80.3	80.6	80.6
Average	79.8	80.1	79.7	80.0	79.9	79.8	80.0	80.0
Std Deviation	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

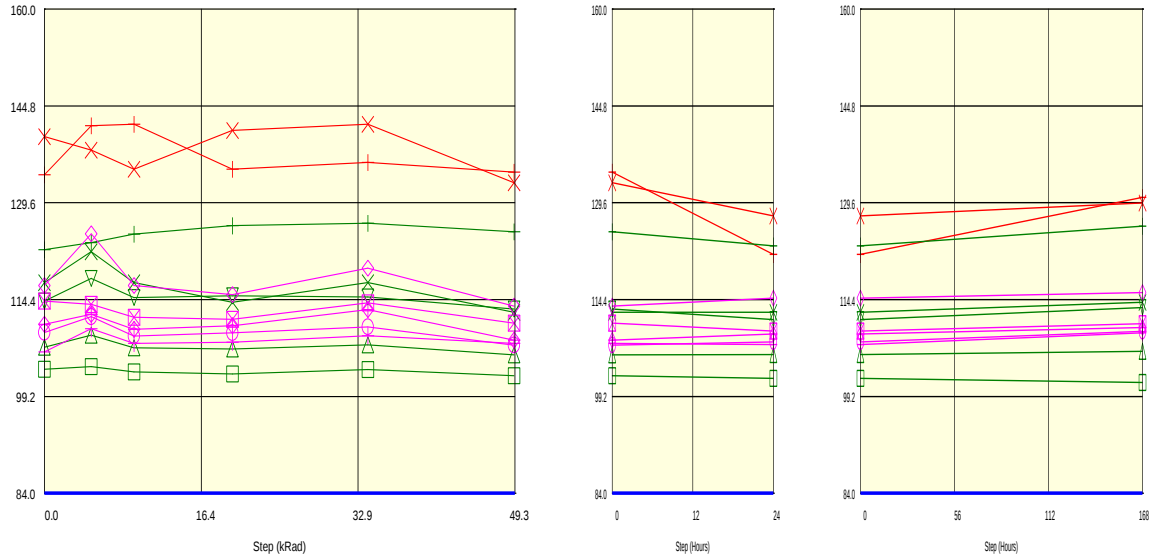
Parameter : Common Mode Rejection Ratio : CMRR_5V

Test conditions : Vcm = +1.5V to +3.5V

Unit : dB

Spec Limit Min : 84.0

Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 x 3 triangle 4 inverted triangle 5 square 6 diamond 7 square 8 circle 9 circle 10 + 11 x 1_OUT

Measurements

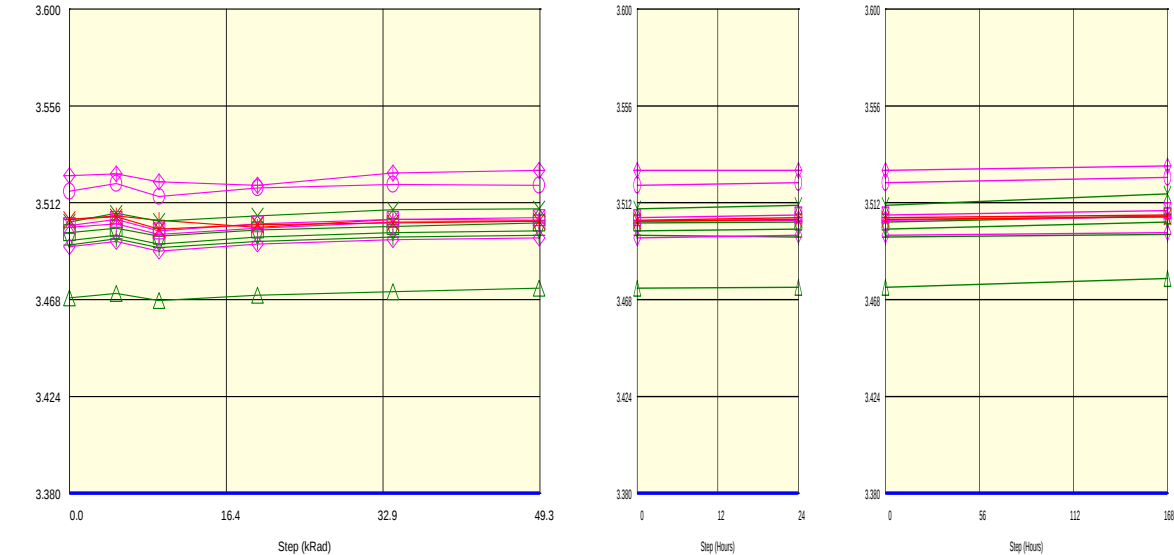
CMRR_5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	134.0	141.7	141.9	134.9	135.9	134.4	121.5	130.5
1_OUT_REF	140.0	137.9	134.9	141.0	141.9	132.8	127.5	129.6
ON samples								
2	122.3	123.3	124.7	126.0	126.4	125.0	122.9	125.9
3	117.1	121.9	117.1	114.0	117.1	112.4	112.4	114.0
4	106.9	108.8	106.8	106.6	107.3	105.7	105.8	106.3
5	114.2	117.7	114.7	115.0	114.8	112.9	111.2	113.2
6	103.5	103.9	103.1	102.7	103.4	102.5	102.0	101.4
Statistics								
Min	103.5	103.9	103.1	102.7	103.4	102.5	102.0	101.4
Max	122.3	123.3	124.7	126.0	126.4	125.0	122.9	125.9
Average	112.8	115.1	113.3	112.9	113.8	111.7	110.9	112.1
Std Deviation	6.8	7.6	7.7	8.0	8.0	7.8	7.1	8.3

Measurements

CMRR_5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	134.0	141.7	141.9	134.9	135.9	134.4	121.5	130.5
1_OUT_REF	140.0	137.9	134.9	141.0	141.9	132.8	127.5	129.6
OFF samples								
7	116.6	124.7	116.6	115.2	119.3	113.4	114.6	115.5
8	114.2	113.6	111.6	111.3	113.9	110.7	109.5	110.6
9	110.5	112.1	109.7	110.3	112.8	108.0	109.0	110.0
10	109.2	111.7	108.7	109.2	110.1	107.3	107.7	109.4
11	106.2	109.8	107.5	107.7	108.7	107.3	107.3	109.2
Statistics								
Min	106.2	109.8	107.5	107.7	108.7	107.3	107.3	109.2
Max	116.6	124.7	116.6	115.2	119.3	113.4	114.6	115.5
Average	111.3	114.4	110.8	110.7	113.0	109.4	109.6	110.9
Std Deviation	3.7	5.3	3.2	2.5	3.7	2.3	2.6	2.3

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

Parameter : Output Voltage Swing (plus) : Vout+_5V
 Test conditions :
 Unit : V
 Spec Limit Min : 3.380
 Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 × 3 △ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 × 1_OUT

Measurements								
Vout+_ 5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	3.504	3.506	3.504	3.501	3.504	3.504	3.505	3.506
1_OUT_REF	3.504	3.506	3.500	3.502	3.503	3.504	3.504	3.506
ON samples								
2	3.493	3.496	3.492	3.494	3.496	3.497	3.496	3.498
3	3.503	3.507	3.504	3.506	3.509	3.509	3.511	3.516
4	3.469	3.471	3.468	3.470	3.472	3.473	3.474	3.478
5	3.495	3.497	3.493	3.496	3.498	3.499	3.500	3.503
6	3.498	3.500	3.497	3.500	3.501	3.503	3.503	3.506
Statistics								
Min	3.469	3.471	3.468	3.470	3.472	3.473	3.474	3.478
Max	3.503	3.507	3.504	3.506	3.509	3.509	3.511	3.516
Average	3.492	3.494	3.491	3.493	3.495	3.496	3.497	3.500
Std Deviation	0.012	0.012	0.012	0.012	0.013	0.012	0.013	0.013

Measurements								
Vout+_ 5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	3.504	3.506	3.504	3.501	3.504	3.504	3.505	3.506
1_OUT_REF	3.504	3.506	3.500	3.502	3.503	3.504	3.504	3.506
OFF samples								
7	3.492	3.494	3.490	3.493	3.495	3.496	3.497	3.498
8	3.502	3.504	3.499	3.502	3.504	3.505	3.506	3.508
9	3.524	3.525	3.522	3.520	3.526	3.527	3.527	3.529
10	3.517	3.521	3.515	3.519	3.520	3.520	3.521	3.524
11	3.501	3.502	3.498	3.500	3.503	3.504	3.504	3.506
Statistics								
Min	3.492	3.494	3.490	3.493	3.495	3.496	3.497	3.498
Max	3.524	3.525	3.522	3.520	3.526	3.527	3.527	3.529
Average	3.507	3.509	3.505	3.507	3.510	3.510	3.511	3.513
Std Deviation	0.012	0.012	0.012	0.011	0.011	0.011	0.011	0.011

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

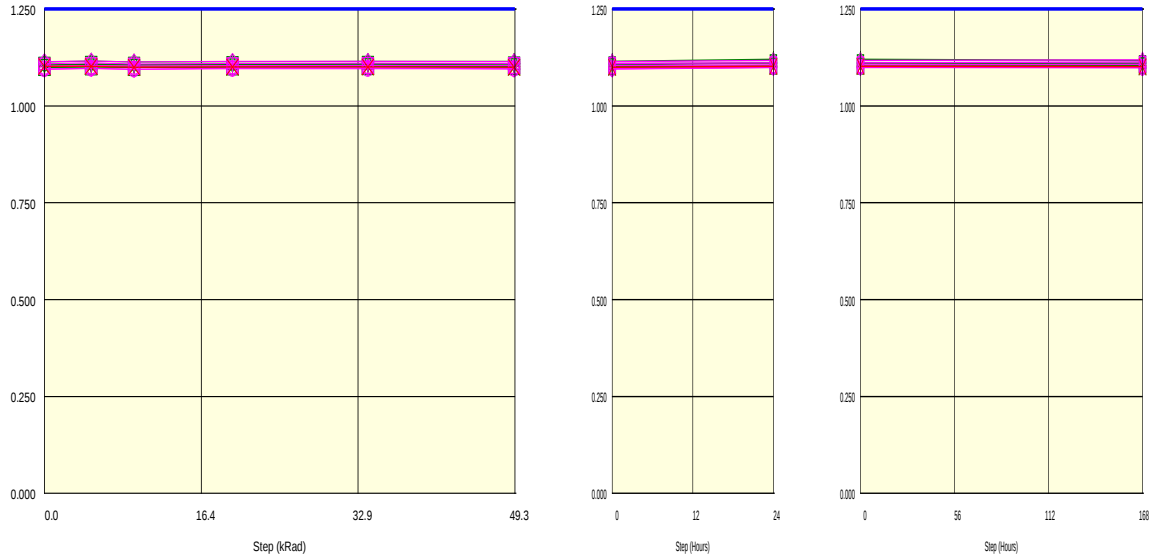
Parameter : Output Voltage Swing (minus) : Vout_5V

Test conditions :

Unit : V

Spec Limit Max : 1.250

Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 × 3 △ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 × 1_OUT

Measurements

Vout_ 5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	1.102	1.104	1.102	1.103	1.103	1.102	1.103	1.104
1_OUT_REF	1.102	1.102	1.100	1.101	1.101	1.100	1.103	1.102
ON samples								
2	1.106	1.109	1.107	1.108	1.109	1.109	1.110	1.111
3	1.100	1.101	1.100	1.100	1.101	1.100	1.103	1.101
4	1.113	1.116	1.114	1.115	1.115	1.115	1.120	1.118
5	1.106	1.107	1.105	1.107	1.107	1.106	1.111	1.109
6	1.100	1.101	1.099	1.100	1.101	1.102	1.103	1.104
Statistics								
Min	1.100	1.101	1.099	1.100	1.101	1.100	1.103	1.101
Max	1.113	1.116	1.114	1.115	1.115	1.115	1.120	1.118
Average	1.105	1.107	1.105	1.106	1.107	1.106	1.110	1.109
Std Deviation	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.006

Measurements

Vout_ 5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	1.102	1.104	1.102	1.103	1.103	1.102	1.103	1.104
1_OUT_REF	1.102	1.102	1.100	1.101	1.101	1.100	1.103	1.102
OFF samples								
7	1.115	1.116	1.114	1.115	1.115	1.115	1.118	1.119
8	1.103	1.104	1.103	1.104	1.104	1.105	1.106	1.108
9	1.095	1.097	1.095	1.098	1.099	1.096	1.099	1.100
10	1.095	1.097	1.095	1.096	1.097	1.096	1.100	1.099
11	1.109	1.112	1.108	1.110	1.110	1.110	1.112	1.114
Statistics								
Min	1.095	1.097	1.095	1.096	1.097	1.096	1.099	1.099
Max	1.115	1.116	1.114	1.115	1.115	1.115	1.118	1.119
Average	1.104	1.105	1.103	1.105	1.105	1.104	1.107	1.108
Std Deviation	0.008	0.008	0.008	0.007	0.007	0.007	0.007	0.008

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

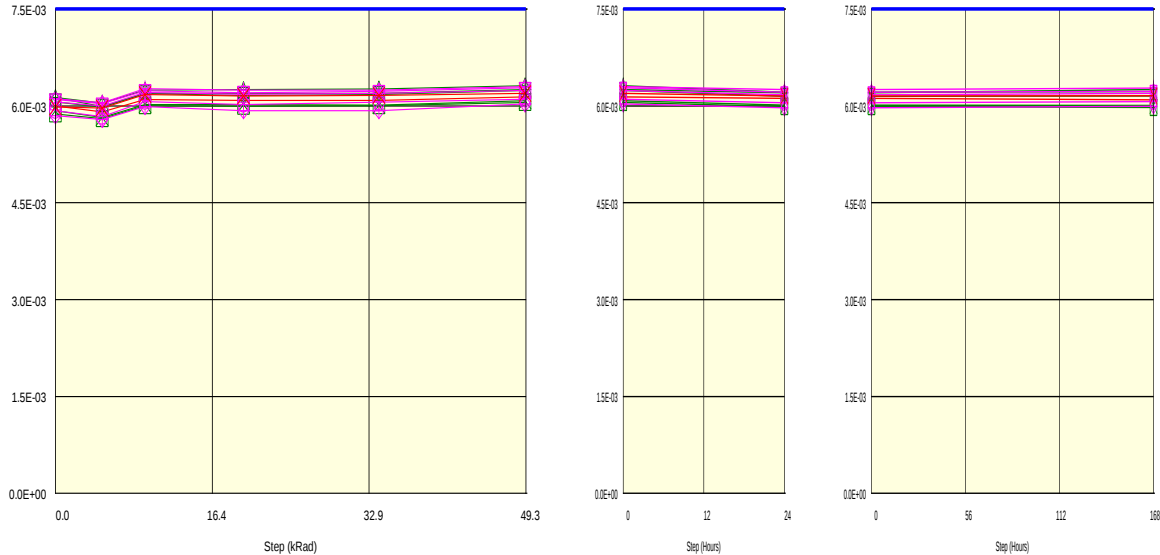
Parameter : Positive Supply Current : IsEN_5V

Test conditions : Output Enabled

Unit : A

Spec Limit Max : 7.5E-03

Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 × 3 △ 4 ▽ 5 □ 6 ◇ 7 ☒ 8 ⬢ 9 ○ 10 + 11 × 1_OUT

Measurements

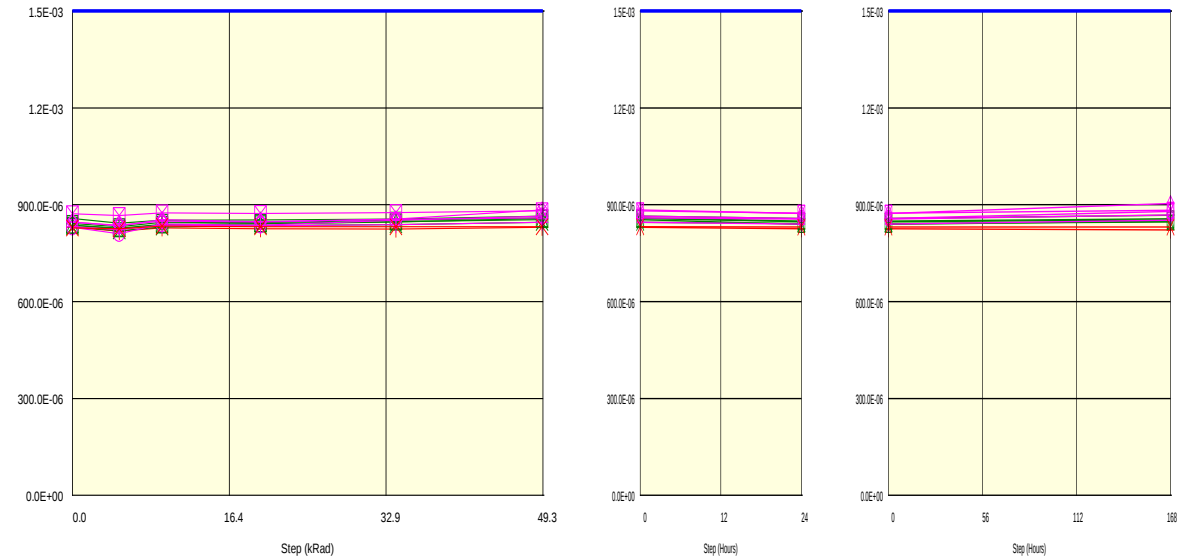
IsEN_5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	6.0E-03	5.9E-03	6.1E-03	6.1E-03	6.1E-03	6.1E-03	6.1E-03	6.1E-03
1_OUT_REF	6.0E-03	6.0E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03
ON samples								
2	6.1E-03	6.0E-03	6.2E-03	6.2E-03	6.2E-03	6.3E-03	6.2E-03	6.3E-03
3	5.9E-03	5.8E-03	6.0E-03	6.0E-03	6.0E-03	6.1E-03	6.0E-03	6.0E-03
4	6.1E-03	6.0E-03	6.2E-03	6.3E-03	6.3E-03	6.3E-03	6.2E-03	6.2E-03
5	6.1E-03	6.0E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03	6.1E-03	6.2E-03
6	5.9E-03	5.8E-03	6.0E-03	6.0E-03	6.0E-03	6.1E-03	6.0E-03	6.0E-03
Statistics								
Min	5.9E-03	5.8E-03	6.0E-03	6.0E-03	6.0E-03	6.1E-03	6.0E-03	6.0E-03
Max	6.1E-03	6.0E-03	6.2E-03	6.3E-03	6.3E-03	6.3E-03	6.2E-03	6.3E-03
Average	6.0E-03	5.9E-03	6.1E-03	6.1E-03	6.1E-03	6.2E-03	6.1E-03	6.1E-03
Std Deviation	104.6E-06	97.1E-06	99.7E-06	100.4E-06	105.0E-06	101.2E-06	93.6E-06	111.7E-06

Measurements

IsEN_5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	6.0E-03	5.9E-03	6.1E-03	6.1E-03	6.1E-03	6.1E-03	6.1E-03	6.1E-03
1_OUT_REF	6.0E-03	6.0E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03
OFF samples								
7	6.1E-03	6.0E-03	6.2E-03	6.2E-03	6.2E-03	6.3E-03	6.2E-03	6.2E-03
8	6.1E-03	6.0E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03
9	5.9E-03	5.8E-03	6.0E-03	5.9E-03	5.9E-03	6.0E-03	6.0E-03	6.0E-03
10	5.9E-03	5.8E-03	6.1E-03	6.0E-03	6.1E-03	6.1E-03	6.1E-03	6.1E-03
11	6.1E-03	6.0E-03	6.3E-03	6.2E-03	6.2E-03	6.3E-03	6.3E-03	6.3E-03
Statistics								
Min	5.9E-03	5.8E-03	6.0E-03	5.9E-03	5.9E-03	6.0E-03	6.0E-03	6.0E-03
Max	6.1E-03	6.0E-03	6.3E-03	6.2E-03	6.2E-03	6.3E-03	6.3E-03	6.3E-03
Average	6.0E-03	5.9E-03	6.2E-03	6.1E-03	6.1E-03	6.2E-03	6.1E-03	6.2E-03
Std Deviation	103.9E-06	106.9E-06	107.3E-06	121.4E-06	121.6E-06	105.8E-06	104.5E-06	105.1E-06

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

Parameter : Positive Supply Current : IsDIS_5V
 Test conditions : Output Disabled
 Unit : A
 Spec Limit Max : 1.5E-03
 Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 × 3 △ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 × 1_OUT

Measurements								
IsDIS_5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	830.7E-06	818.0E-06	828.1E-06	826.0E-06	825.1E-06	830.2E-06	826.2E-06	822.4E-06
1_OUT_REF	828.3E-06	825.8E-06	833.9E-06	831.9E-06	832.2E-06	832.0E-06	831.2E-06	831.0E-06
ON samples								
2	857.4E-06	843.1E-06	852.0E-06	853.4E-06	856.0E-06	864.6E-06	858.0E-06	867.8E-06
3	831.7E-06	819.3E-06	831.6E-06	835.5E-06	838.4E-06	846.2E-06	842.3E-06	846.9E-06
4	837.0E-06	825.4E-06	837.3E-06	841.6E-06	847.6E-06	854.2E-06	839.7E-06	849.6E-06
5	842.1E-06	831.7E-06	845.5E-06	844.8E-06	851.8E-06	859.8E-06	849.3E-06	856.3E-06
6	836.5E-06	827.4E-06	839.3E-06	841.2E-06	846.9E-06	857.2E-06	847.6E-06	852.7E-06
Statistics								
Min	831.7E-06	819.3E-06	831.6E-06	835.5E-06	838.4E-06	846.2E-06	839.7E-06	846.9E-06
Max	857.4E-06	843.1E-06	852.0E-06	853.4E-06	856.0E-06	864.6E-06	858.0E-06	867.8E-06
Average	841.0E-06	829.4E-06	841.1E-06	843.3E-06	848.1E-06	856.4E-06	847.4E-06	854.6E-06
Std Deviation	8.9E-06	7.9E-06	7.0E-06	5.9E-06	5.9E-06	6.1E-06	6.4E-06	7.3E-06

Measurements								
IsDIS_5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	830.7E-06	818.0E-06	828.1E-06	826.0E-06	825.1E-06	830.2E-06	826.2E-06	822.4E-06
1_OUT_REF	828.3E-06	825.8E-06	833.9E-06	831.9E-06	832.2E-06	832.0E-06	831.2E-06	831.0E-06
OFF samples								
7	845.9E-06	836.9E-06	849.5E-06	847.1E-06	854.6E-06	859.7E-06	855.3E-06	868.7E-06
8	871.8E-06	867.1E-06	874.9E-06	873.0E-06	876.1E-06	881.2E-06	874.3E-06	882.7E-06
9	846.5E-06	835.2E-06	853.7E-06	847.3E-06	855.5E-06	884.3E-06	873.0E-06	904.1E-06
10	830.0E-06	810.3E-06	840.0E-06	837.1E-06	851.8E-06	864.7E-06	857.4E-06	879.2E-06
11	832.3E-06	822.7E-06	836.7E-06	835.3E-06	838.5E-06	846.2E-06	840.4E-06	852.4E-06
Statistics								
Min	830.0E-06	810.3E-06	836.7E-06	835.3E-06	838.5E-06	846.2E-06	840.4E-06	852.4E-06
Max	871.8E-06	867.1E-06	874.9E-06	873.0E-06	876.1E-06	884.3E-06	874.3E-06	904.1E-06
Average	845.3E-06	834.4E-06	851.0E-06	848.0E-06	855.3E-06	867.2E-06	860.1E-06	877.4E-06
Std Deviation	14.9E-06	18.9E-06	13.4E-06	13.5E-06	12.0E-06	14.1E-06	12.5E-06	17.0E-06

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

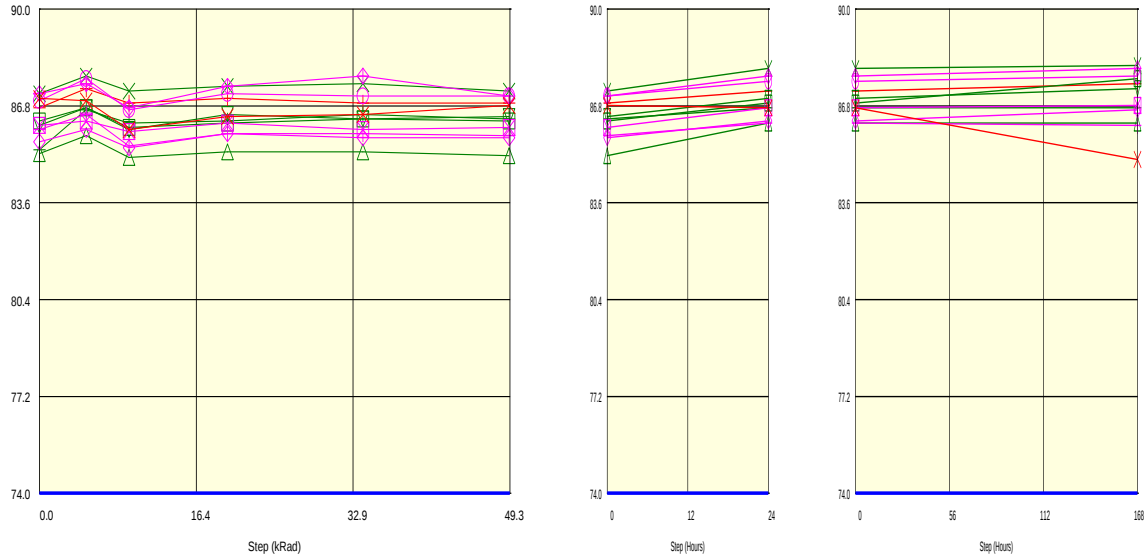
Parameter : Power Supply Rejection Ratio (plus) : PSRR+_5V

Test conditions : Vcc = +4.5V to +5.5V. Vee = 0V

Unit : dB

Spec Limit Min : 74.0

Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 10 + 11 X 1_OUT

Measurements

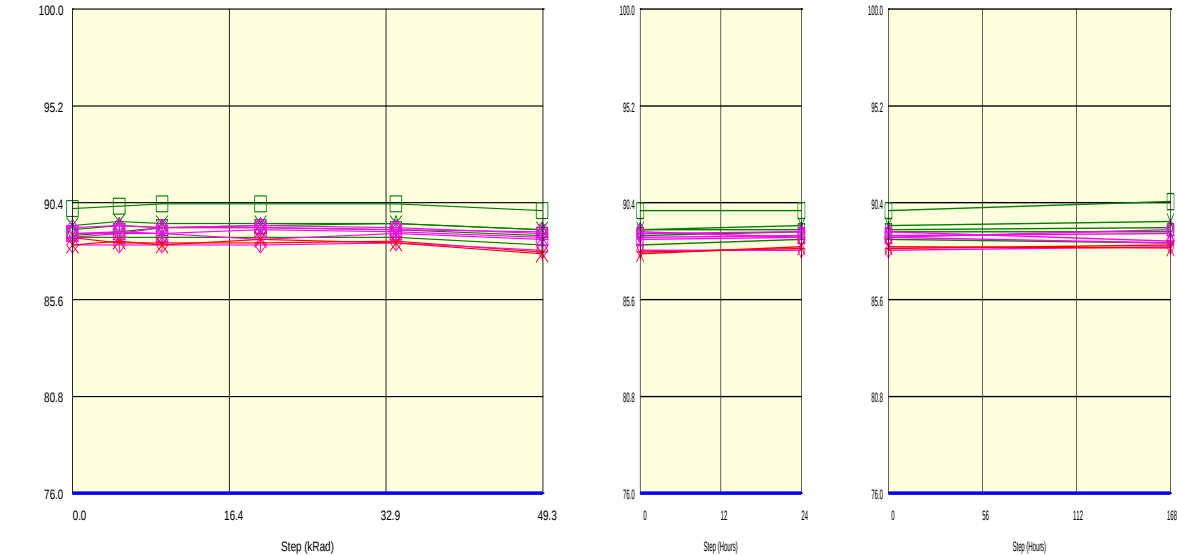
PSRR+ 5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	86.7	87.4	86.9	87.1	86.9	86.9	87.3	87.5
1_OUT_REF	87.1	87.0	86.0	86.4	86.5	86.8	86.7	85.0
ON samples								
2	85.4	86.7	86.2	86.3	86.5	86.4	86.7	86.7
3	87.2	87.8	87.3	87.5	87.5	87.3	88.0	88.1
4	85.2	85.8	85.1	85.3	85.3	85.2	86.2	86.2
5	86.2	86.7	86.0	86.5	86.4	86.4	87.1	87.4
6	86.3	86.7	86.1	86.2	86.4	86.3	86.9	87.7
Statistics								
Min	85.2	85.8	85.1	85.3	85.3	85.2	86.2	86.2
Max	87.2	87.8	87.3	87.5	87.5	87.3	88.0	88.1
Average	86.1	86.8	86.1	86.4	86.4	86.3	87.0	87.2
Std Deviation	0.7	0.6	0.7	0.7	0.7	0.7	0.6	0.7

Measurements

PSRR+ 5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	86.7	87.4	86.9	87.1	86.9	86.9	87.3	87.5
1_OUT_REF	87.1	87.0	86.0	86.4	86.5	86.8	86.7	85.0
OFF samples								
7	85.6	86.0	85.4	85.9	85.7	85.7	86.3	86.7
8	86.2	86.3	86.0	86.2	86.0	86.1	86.7	86.8
9	87.2	87.5	86.7	87.5	87.8	87.1	87.8	88.0
10	87.0	87.7	86.7	87.2	87.1	87.1	87.6	87.8
11	86.0	86.5	85.5	85.9	85.9	85.8	86.2	86.2
Statistics								
Min	85.6	86.0	85.4	85.9	85.7	85.7	86.2	86.2
Max	87.2	87.7	86.7	87.5	87.8	87.1	87.8	88.0
Average	86.4	86.8	86.1	86.5	86.5	86.4	86.9	87.1
Std Deviation	0.6	0.7	0.6	0.7	0.8	0.6	0.7	0.7

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

Parameter : Power Supply Rejection Ratio (minus) : PSRR- _5V
Test conditions : Vcc = 5V. Vee = -0.5V to +0.5V
Unit : dB
Spec Limit Min : 76.0
Spec limits are represented in bold lines on the graphic.



+ 1_IN + 2 ✕ 3 △ 4 ▽ 5 □ 6 ◇ 7 ☒ 8 ⬢ 9 ○ 10 + 11 ✕ 1_OUT

Measurements								
PSRR- 5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	88.7	88.4	88.4	88.4	88.5	88.0	88.1	88.3
1_OUT_REF	88.3	88.5	88.3	88.6	88.4	87.9	88.2	88.2
ON samples								
2	88.7	88.7	88.7	88.7	88.7	88.3	88.6	88.4
3	89.3	89.5	89.4	89.4	89.4	89.1	89.3	89.5
4	89.1	89.3	89.2	89.3	89.4	89.1	89.1	89.2
5	88.8	89.0	89.2	89.2	89.1	88.8	89.0	89.0
6	90.1	90.2	90.3	90.3	90.3	90.0	90.0	90.5
Statistics								
Min	88.7	88.7	88.7	88.7	88.7	88.3	88.6	88.4
Max	90.1	90.2	90.3	90.3	90.3	90.0	90.0	90.5
Average	89.2	89.3	89.3	89.4	89.4	89.0	89.2	89.3
Std Deviation	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.7

Measurements								
PSRR- 5V	0 kRad	4.9 kRad	9.4 kRad	19.7 kRad	33.9 kRad	49.2 kRad	24 Hours	168 Hours
1_IN_REF	88.7	88.4	88.4	88.4	88.5	88.0	88.1	88.3
1_OUT_REF	88.3	88.5	88.3	88.6	88.4	87.9	88.2	88.2
OFF samples								
7	88.3	88.3	88.3	88.3	88.4	88.0	88.0	88.2
8	88.9	89.0	88.9	89.1	89.0	88.7	88.8	88.9
9	89.2	89.3	89.2	89.3	89.2	88.9	89.0	88.5
10	88.9	88.9	89.2	89.2	89.1	89.0	88.7	89.1
11	88.7	88.9	88.9	88.6	88.9	88.6	88.7	88.4
Statistics								
Min	88.3	88.3	88.3	88.3	88.4	88.0	88.0	88.2
Max	89.2	89.3	89.2	89.3	89.2	89.0	89.0	89.1
Average	88.8	88.9	88.9	88.9	88.9	88.6	88.6	88.6
Std Deviation	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01555
	AD8021ARZ	Analog Devices	Issue:	01

Appendix 1: CO⁶⁰ Irradiation certificate

Customer: HIR Case followed up by: LP
FAO: Frédéric TILHAC

Source: Coblat-60 (Co60)	
Certificate	N° 36708 of 08/10/2015
Activity	14.8 TBq of 04/09/2015

Reference : PV/ATR/GAMRAY-210/XX21/HIR/LP/1711
Device irradiated : NA
*Irradiation certificate applied only to the device subjected to the irradiation
in agreement with the quality procedure according ESCC 22900 (Pro.026 Rev. 5)*

Irradiation environment

	Units	Min	Max	Time-weighted average
Temperature	°C	17.9	20.8	19.6
Relative humidity	%	28.7	52.8	39.9

Dose rate measurement

The instruments used for dose rate measurement is a PTW ionization chamber(TM30013) and universal dosimeter UNIDOS E which is controlled annually.

UNIDOS E	Serial number: 82253	Certificate number: 17D243	Date: 27/10/2017
TM30013	Serial number: 9314	Certificate number: 17D243	Date: 27/10/2017

*The measurement unit of the international system for the dose rate is Gy/s. We commonly use rad/h (1 Gy/h = 100 rad/h).
The dose rate is measured at the center of the device.*

TRAD position	Date	Dose rate [rad/h] (Kerma in the air)
210-4B	19/10/2017	220.21

Dosimetry

Each exit and input of Cobalt-60 source is logged in a digital file. We compute the dose at each step taking into account the source decay, the dose rate measured by the gamma probe and the downtime irradiation.

TRAD position	Date	Total Ionizing dose [krad] (Kerma in the air)
210-4B	13/11/2017	-
	14/11/2017	4.89
	15/11/2017	9.42
	17/11/2017	19.77
	20/11/2017	34.00
	23/11/2017	49.31

Measurement uncertainty : 1.6%

ESCC 22900: The dose at the device under test shall be measured to a resolution of better than 10%. The test devices shall be exposed to within 10% of the specified radiation dose level(s).

The gamma-ray dose rate of a Cobalt 60 source shall be calibrated in accordance with the requirements of ESCC Basic Specification No. 21500 to 5% or better. Dosimetry shall be traceable to national standards.